

The Iron Age

A CHILTON

PUBLICATION

NATIONAL METALWORKING WEEKLY

March 5, 1953

March 5, 1953

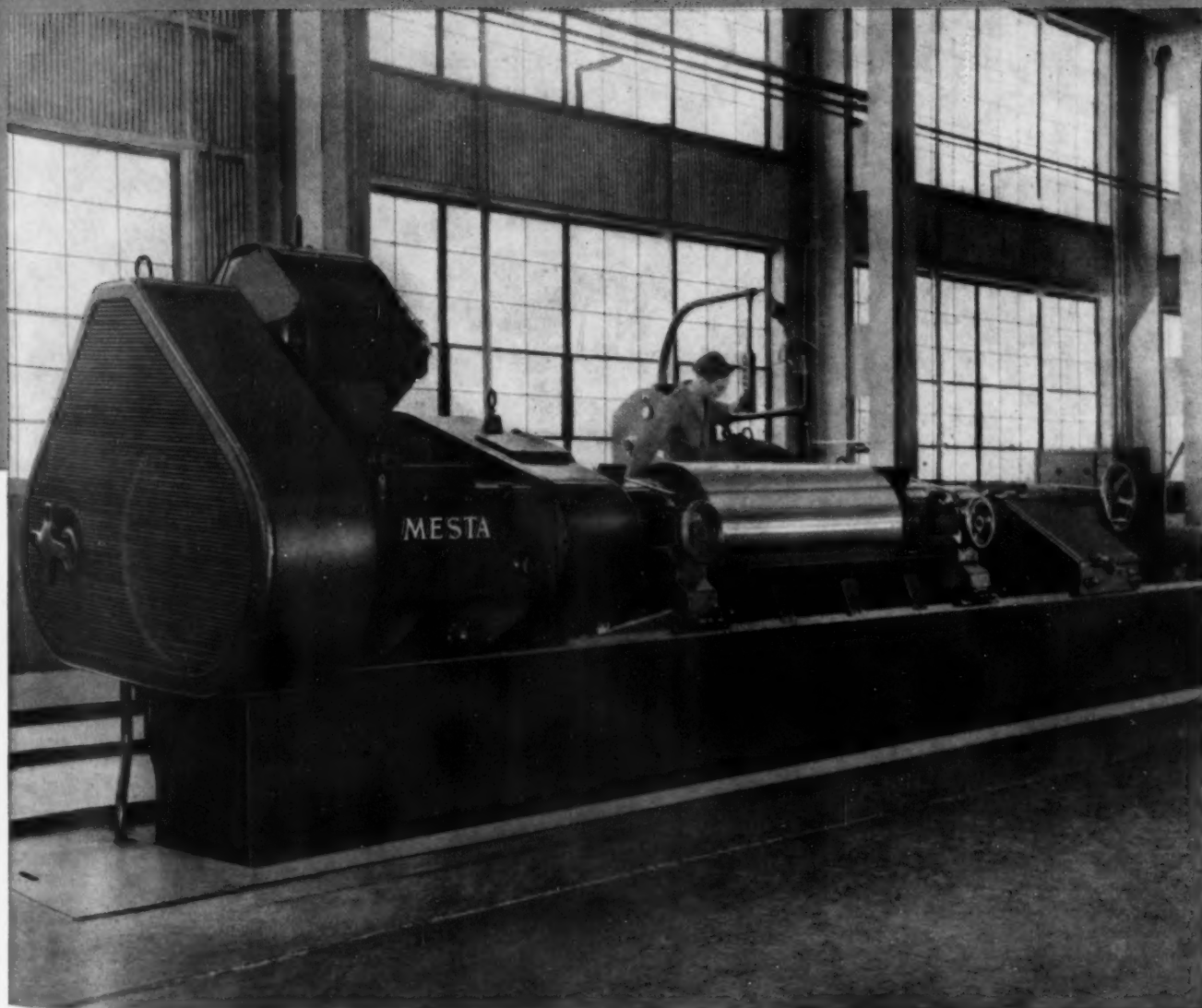
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PAGE 2

MESTA

heavy duty

ROLL GRINDERS



Color Photo by E. D. MESTA

Mesta Roll Grinders of simplified design are the most accurate and dependable grinding machines available today. Built with precision for the finest finishing and with ruggedness for the heaviest roughing.

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JOB: Grinding welds on truck cabs. Using slow, 20-pound electric grinders. Only 2800 r.p.m. under load.

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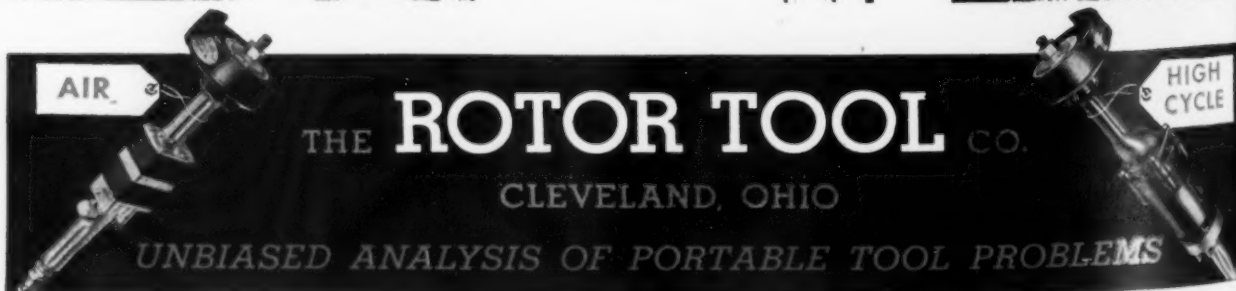
Call in your Rotor Application Engineer for a study of your portable tool operations to suggest improvements. Write for Catalog No. 38.

AIR O'TOOL

ROTOR GRINDER FACTS

LIGHTER . . . Unique two-blade design and magnesium handles. Easy to move around. 6" Rotor Grinder weighs only 9¼ lbs. . . . 8" only 11¼ lbs.

FASTER . . . Rotor Grinders, known as the "Power Plus" line are recognized everywhere for their high speed under load.



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Editorial

The Iron Age

FOUNDED 1855

Vice-President in Charge of Souls

TENSIONS, troubles and crises are pretty personal things. Their impact varies on all of us. Bystanders often feel they know the feelings of those who become "cornered" from time to time. Maybe they do and maybe they don't.

We think living today has more trials and tribulations than in the past. Evidence seems to prove this. Yet those who lived in the past felt the same way—those who come after us will think they have the most troubles.

This state of frustration often affects business people—especially key workers. Years ago this condition was offset because there was always someone to "talk at." Today, fast tempo and competition act as a barrier to plain talk.

A man with personal troubles or a man who is "mixed up" can't always go to his boss. The latter might—and in some cases does—use such information to the detriment of the man who "talked."

Troubles can't be told always to subordinates lest they misuse the information—either against the one who told or to their own advantage.

Because of this, many problems go unsolved—with the man and the company losers. The armed forces have their chaplains. They are available for spiritual advice, common sense talks, practical help and act as safety valves. Several business firms employ chaplains who do the same type of work.

Maybe a down-to-earth chaplain who knows life and business is a partial answer to some businessmen's troubles. He would be a man of good character, experienced in knowing man's strength and weakness. His strong point would be a man's knowledge that a chaplain respects and invites confidences.

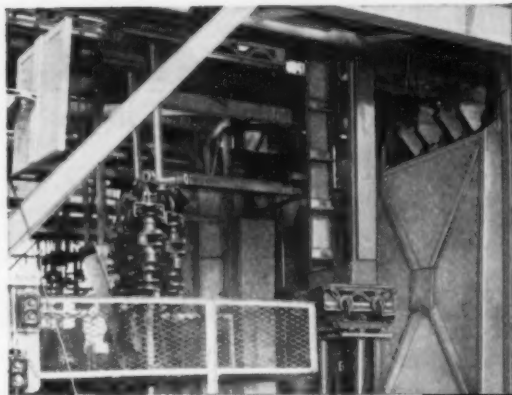
Our business chaplain would report to his own conscience—details and names would not be divulged. His help would be available on request to those who felt they needed him. His humility and ability to treat soul-shattering problems with simplicity and lack of prejudice would be his trademark.

We have vice-presidents for production, sales, purchasing, public and industrial relations and research. Why not a vice-president of souls?

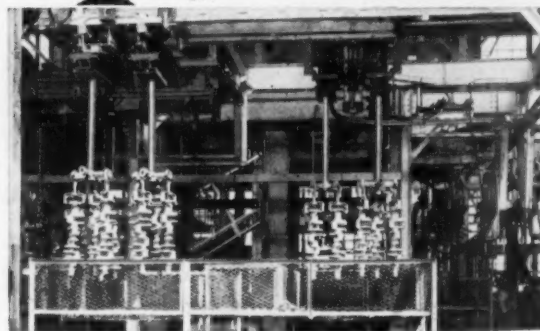
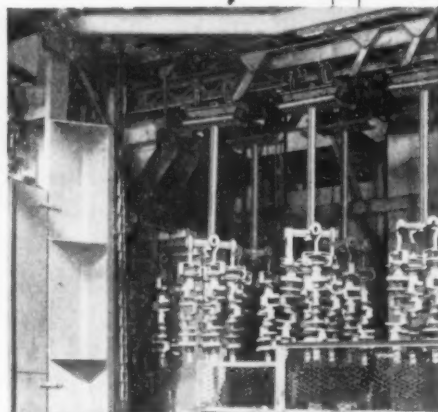
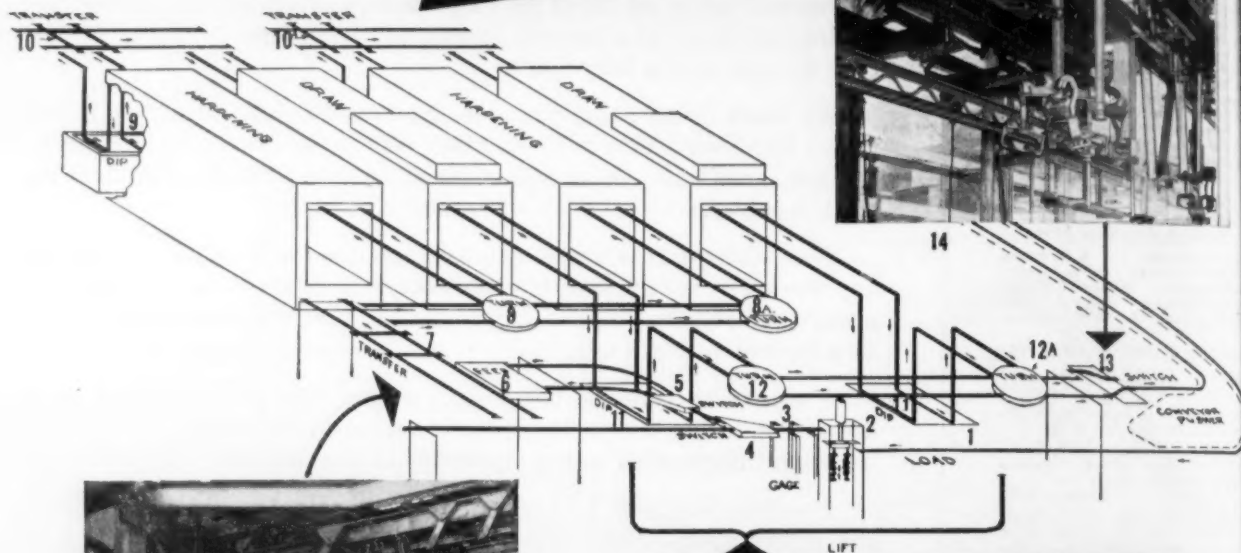
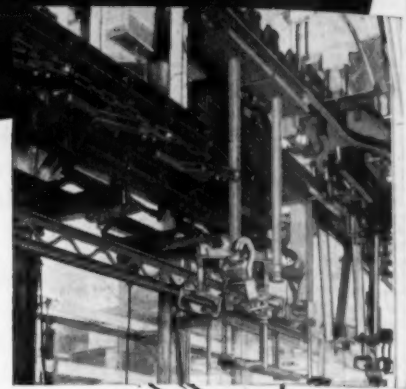
Tom Campbell

Editor

March 5, 1953



"Automation" by AMERICAN MONORAIL



KEY TO DIAGRAM

Station No. 1, Empty Carriers are loaded with 4 crankshafts and raised on Lift No. 2 to working level of furnaces. Carriers pass through gaging device No. 3 to insure concentric loading. Loaded carriers are pushed through Switch No. 4 and Switch No. 5 which are controlled manually from the floor. Carriers are deflected right or left into Feed No. 6. From this point on the system is fully automatic.

Carriers work through Automatic Feed No. 6 onto Transfer Crane No. 7 which travels and lines up with Spur Tracks going to Turntable No. 8. Carriers then move onto the turntable and rotate 90 degrees for feed through the Hardening Furnace.

Upon emerging from this furnace they are dipped into Quench Tank No. 9 and then travel on Transfer Crane No. 10 which carries racks for return travel through the Drawing Furnace. Crankshafts then travel through this furnace and when finished are cooled in Tank No. 11 and fed through Turntable No. 12.

After rotation of 90 degrees the carriers pass through Shuttle Switch No. 13 for single line movement and pick-up by Pusher Conveyor No. 14 for transfer to unloading station.

From hand operated to fully automatic handling systems, American MonoRail will save you money. Regardless of how simple or how complicated your handling problems may appear to be, American MonoRail can engineer a system to fit your needs. Experienced engineers will gladly consult with you on any handling problems. Write for the new "Case Study File" showing many varied applications.

THE AMERICAN

MONORAIL

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13103 ATHENS AVENUE

CLEVELAND 7, OHIO

Dear Editor:

Letters from readers

Processing Steel Strip

Sir:
On the Newsfront page of the Feb. 12 issue you had an item on a continuous process for cleaning, phosphate coating and enameling of steel strip developed by a major fabricator.

We are interested in learning more about this process and wonder if you can give us the name of the major fabricator who has developed this process.

C. G. NORDMARK
Advertising Manager

L. S. Starrett Co.
Athol, Mass.

Further information may be obtained from the R. C. Mahon Co., 6565 East 8 Mile Road, Detroit, Mich.—Ed.

New Stainless Steel

Sir:
We refer to the article on p. 282 of your Jan. 1 issue which mentions a new type of stainless steel called 16-16-1.

Any further information you could get on this steel for us pertaining both to availability and priorities required to purchase this steel, would be greatly appreciated.

P. T. HARKER

Scott Viter Co.
Columbus, Ohio

A news story on 16-16-1 appeared on p. 228 of the Jan 1 issue. Among the producers of this new grade are: Republic Steel Corp., Crucible Steel Co. of America, Allegheny-Ludlum Steel Corp. and U. S. Steel Corp. There are no priorities involved in producing this grade as it contains less than 1 pct nickel.—Ed.

Propaganda

Sir:
Your observation that the exhibition of Chinese machine tools at the Leipzig Fair in East Germany (Oct. 30, 1952, p. 39) was a "purely political display" is an understatement in my opinion.

If my eyes haven't deceived me, I have seen the same or an exactly similar 25-ton double column vertical boring machine, shown in your photograph, at the last International Industries Fair held in January 1952, in Bombay.

I had quite a long and detailed talk on this and other engineering exhibits with the attendants at the Chinese and Russian pavilions but couldn't get any convincing reply as to whether these tools represented typical samples of Chinese industrial output or just "show" items. The

only conclusion I could come to from some of the statements made by the Russian attendants at the Russian pavilion was that the tools were probably not even made in China but made in Russia for China.

This belief was strengthened when I found that the Chinese had brought a 5-ton steel ingot as a sample of the great strides made by Chinese industry. My biggest surprise came when I found many of my own countrymen—the average village peasant and even townfolk—admiring the ingot as an achievement of the "new" China compared to "backward" India. To me, an employee of the vast Tata Iron & Steel Co., this was going too far.

But that is how things happened and I must say that as a political propaganda measure, the International Exhibition — it was really a Communist exhibit as practically every participating nation was from the Soviet bloc—was a grand success.

V. SUBRAMANIAM
Metallurgical Engineer

Tata Iron & Steel Co.
Calcutta, India

Welding Rods

Sir:

We have experienced considerable difficulty in procuring Nirod or similar high nickel content welding rod for our casting repair.

It seems the authorities in Washington feel a 55 pct nickel rod is satisfactory, however, we find it is not.

Can you advise me what other foundrymen are using to weld cast iron?

G. A. PEALER

General Electric Co.
Elmira, N. Y.

Here are some rods depending on the welding process being used: For metal arc—fluxcoated aluminum bronze; for oxyacetylene—Oxweld No. 25 bronze or Oxweld No. 9 rod; for inert gas-shielded—Everdur or cast iron rod. Bronze rods are used by many for welding cast iron where color match creates no problem. Preheating may be necessary before welding some grades of cast iron.—Ed.

Double-Header

Sir:

We would appreciate receiving three copies of the articles "Automatic Pipe Tester Cuts Inspection Cost" and "Big Presses Tax Design Ingenuity," which appeared in the Jan. 8 issue.

J. BUSEL
Production Engineer

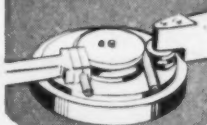
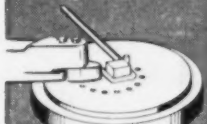
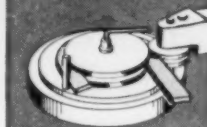
Phoenix Bridge Co.
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This instructive and authoritative booklet will quickly prove itself indispensable wherever bending is done or is needed. It brings you a veritable gold mine of tested authentic bending methods applicable to any rotary type bender. The proper bending technique may frequently offer a new approach to an old problem by simplifying product design and cutting production costs.

The exact methods of producing various types of bends in a wide range of materials are illustrated, step by step, with over 90 diagrams and charts together with valuable tooling suggestions.

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March 5, 1953

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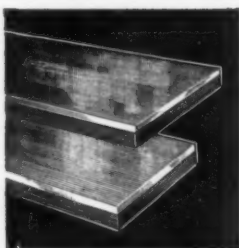
Whatever your needs in flanged and dished heads, you're a winner every time when you call for heads by Claymont.

We can always meet your most exacting specifications because with us the spinning of flanged and dished heads is more than just a job—it's an art into which we put the most painstaking care and specialized know-how.

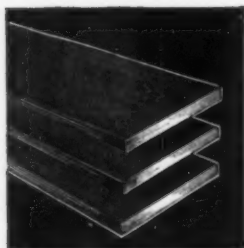
Our flanging department can supply you with flanged and dished heads in diameters from 9 inches to 19 feet and in gauges from 3/16-inch to 6 inches. Made in carbon steel, alloy steel or with stainless steel cladding. We are also prepared to handle head forming operations on both ferrous and non-ferrous metal circles supplied by the customer.

Other Claymont products include Stainless-Clad Steel Plates, Alloy and Carbon Steel Plates, Large Diameter Welded Steel Pipe.

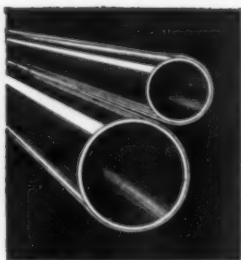
Write or call Claymont Steel Products Department, Wickwire Spencer Steel Division, Claymont, Delaware.



Stainless-Clad Steel Plates



Alloy and Carbon Steel Plates



Large Diameter Welded Steel Pipe

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CLAYMONT STEEL PRODUCTS

PRODUCTS OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION



Fatigue Cracks

by William M. Coffey

This Is Florida

We would like to start this off by saying "nobody in the industry gets around like Managing Editor George Sullivan"—but we can't. As managing editor, executive officer and chief nurse, it's George's lot to assign the travel and expense account stories to someone else.

He stays home and simply makes darn sure THE IRON AGE gets out every week—which is a 24 hour job as anyone can see. But George fell off the horse last week. He junkets off to do a story on General Motors and naturally it took him to Florida, Miami—and this fatigue crack resulted.

Everything that is Miami, says George, can be explained by this (let us say story). To the average, undiscerning eye the only change between the 1952 and the 1953 Cadillac is the change in its famous "V" emblem. The 1952 "V" is chromeplated, the 1953 is gold-plated. (Of course plenty of changes under the hood, but you can't see these).

In Miami George was suddenly struck with the fact that there were no 1952 Cadillacs. He looked and looked but not one of those old 1952's. Cause for wonderment. Very peculiar. And it wasn't explained until, on his way to the racetrack for his story, he suddenly spies a huge gas station sign that spelled out in large letters, GET YOUR GOLDPLATED V HERE, 10 MINUTES. This is Miami, of course.

While we're with George here's another fatigue crack, the result again of a "hooky-trip," only this time not so far, but again about a sort-of-sign. George, as an advisory member of some Atomic Energy Committee, made an inspection tour of the new AEC Cosmotron at the Brookhaven National Laboratory in Long Island.

He wandered over to a huge sign or bulletin board next to the Cosmotron, that had a big "NOTICE!" at the top of it. It looked like it was just the thing to tell him which button to push or wheel to turn to get the thing started. But all it said in large figures was:

$$A = \frac{B + 10(Z' - X') + 10^{-15}}{\pi}$$

March 5, 1953

Changing Horses

We voted that way so nobody is to blame but ourselves:

83D CONGRESS

1ST SESSION

H. J. RES. 183

IN THE HOUSE OF
REPRESENTATIVES

FEBRUARY 9, 1953

Mr. WINSTEAD introduced the following joint resolution; which was referred to the Committee on the Judiciary

JOINT RESOLUTION

Designating the 26th day of May of each year, beginning with the year 1953, as National Hill Billy Music Day.

- 1 Resolved by the Senate and House of Representatives of the United States of America in Congress assembled,
- 2 That the 26th day of May of
- 3 each year, beginning with the
- 4 year 1953, is hereby design-
- 5 ated as National Hill Billy
- 6 Music Day, in recognition of
- 7 the contribution made to
- 8 American music lore by the
- 9 writers, singers, and play-
- 10 ers of hill billy music.

New Puzzle

Helen and her youngest daughter Joan have been spending Christmas with me. I had not seen Joan for more than two years, when she scolded me for giving her the same birthday present for two years running. Joan and her sister go to school with my daughter, Julia. But Julia will be leaving soon, as she will attain the school's age limit of 14. Every Christmas Helen puts by money for her children. She multiplies together the ages last birthday of the children and the product thus arrived at is the number of shillings she puts by. "It must be quite a tidy sum this year," I said. "Well," she replied, "it grows. It's 30 pounds more than the check I wrote out when we were staying with you last." How old is Joan?

METALWASH



AT GENERAL ELECTRIC

Illustration shows work entering METALWASH overhead conveyor-type washer used by the General Electric Company.

This METALWASH machine cleans stainless steel freezer compartment parts.

Other METALWASH machines, also installed at General Electric, perform similar operations in the production of General Electric refrigerators.

*Metalwash engineering skill
and experience are
your assurance
of lasting performance.*

Write on your company letterhead for our free, illustrated Full-Line Catalog.

METALWASH

MACHINERY CORPORATION

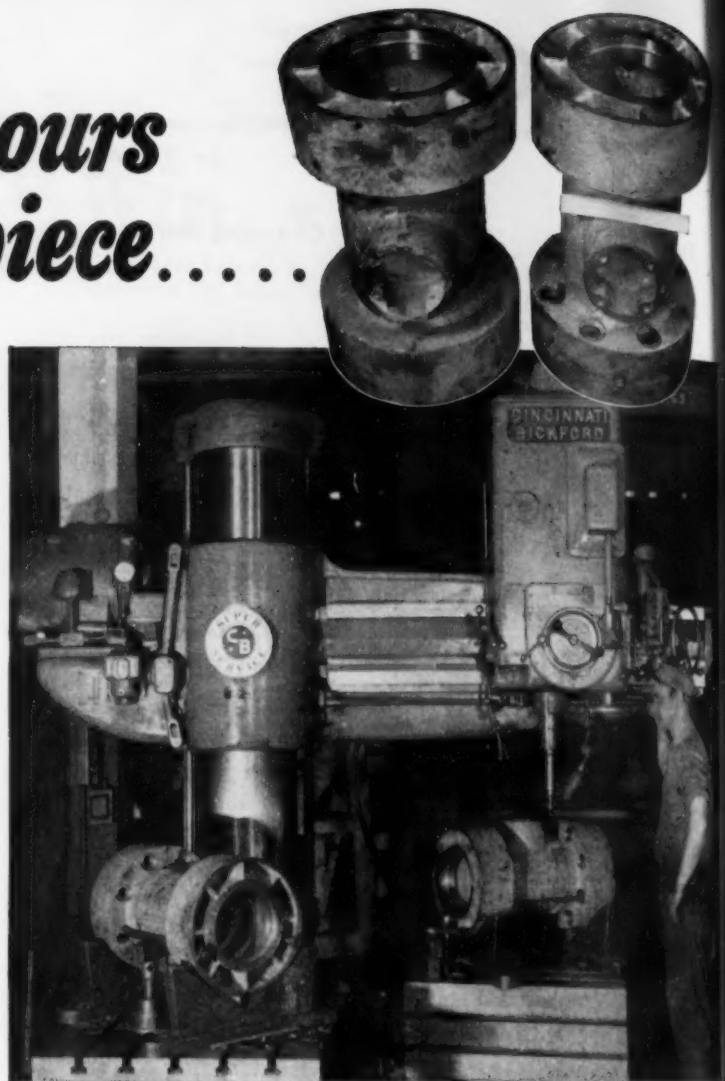
920 North Ave., Elizabeth 4, N. J.
Representatives in principal cities

***saving 2½ hours
per piece.....***

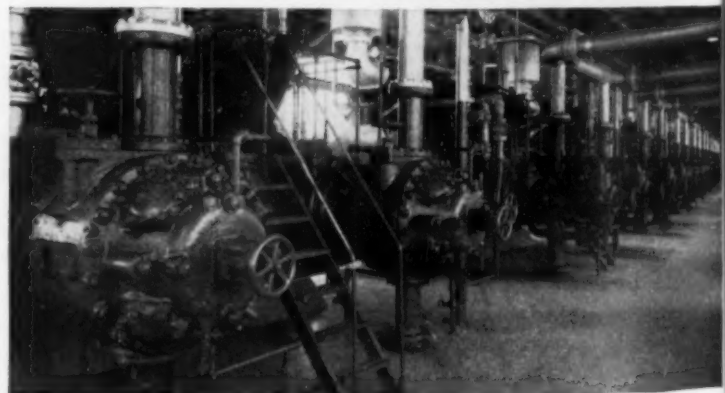
Profitable experience brings satisfaction—and so you find 33 Cincinnati Bickford Drills of all types at the Grove City plant and 20 at the Mt. Vernon plant of The Cooper-Bessemer Corporation.

In the steel compressor bodies shown, and in the front and rear heads which involve similar drilling operations, 1⅜", 2⅜", and 2⅞" holes are bored with a time saving over a previous machine of 2½ hours, floor to floor per unit.

Handling time was much reduced, and the outstanding convenience and ease of control, combined with steady, accurate performance and dependability, effect these marked operating savings.



One of the battery of Cincinnati Bickford Super Service Radial Drills at work on compressor cylinder bodies.



Ten Cooper-Bessemer Type GMV six-cylinder gas engines of The Cooper-Bessemer Corporation at work in a large Canadian oil company plant. A Cincinnati Bickford Super Service Radial worked on these compressor cylinders.

**CINCINNATI
BICKFORD**



RADIAL AND UPRIGHT DRILLING MACHINES

THE CINCINNATI BICKFORD TOOL CO.

Cincinnati 9, Ohio U.S.A.

THE IRON AGE Newsfront

FIRST CONVERSION OF OCEAN-GOING CARGO FREIGHTERS to double-purpose ore and coal carriers will start in April. American-Hawaiian cargo freighters California, Hawaiian and Texan will be converted for use in eastern ore trade 8 months per year, leased to oil companies for the remainder.

AUTOMATIC TRANSMISSIONS IN LIGHT TRUCKS have proven efficient and economical. Now some manufacturers believe they will be standard equipment in 5 years. They are especially effective in delivery and city use where constant shifting is the rule.

NONFERROUS METALS PRODUCERS are being advised by Washington to forget proposals for higher import duties and quotas. Politically speaking, there's little hope for such tariff boosts this year. Alternative: Set up a government agency to buy up mine production when prices dip, sell when prices rise.

ARMY'S GROUND-TO-AIR GUIDED MISSILES would make things hot for enemy bombers. One method of controlling these weapons is by a radar path beamed from the ground. A beam-rider missile following the path would be expected to collide with the intruder aircraft in spite of pilot's efforts to evade his pursuer.

ORDER BOOKS for third quarter steel will be opened as soon as government clarifies decontrol intentions. Firms are free to book third quarter business now but would like assurance that CMP tickets will be dead as of June 30.

CONSERVATION EFFORTS of the Munitions Board are now directed at five materials compared with ten shortly after Korea. Materials currently spotlighted in the program are: Cobalt, columbium, molybdenum, nickel and tungsten. Most critical factor is big amounts needed for high temperature alloys in jets.

A BALING PRESS TO HANDLE REJECT AUTO FRAMES is being developed. It would squeeze frames to bundle size in one operation. The press would handle rejects as soon as they came from the production line, and would simplify scrap handling.

OPEN END CMP MIGHT take some of the hysteria out of the market, some steel producers believe. They think the change would bring a more realistic appraisal of steel needs by consumers. Under full control, consumers generally overestimated needs in the belief that government would trim requests.

DEFENSE WORK IS STILL A GOOD BET FOR LIGHT STEEL BUILDINGS. The jet fighter program which provides for light steel hangars has been a boon for at least one major producer. Hangars are used on small readiness bases in the U. S. as well as Alaska.

PROCESS FOR RECLAIMING LINING BRICK from openhearth and blast furnace may reach the production stage in the very near future.

COMBINATIONS OF GRAINAL AND RARE EARTH OXIDES are being added to some stainless grades where mills get poor yield or experience excessive semi-conditioning. One practice is to add 8 lb. of Grainal No. 79 to the melt immediately after slagoff, and 3 lb of rare earth oxide per ton is added to the ladle.



Like the right size hat
CMP
THINSTEEL *is made*
to fit your need



Are you one of those who constantly find it necessary to adjust and make changes in your fabricating operations to compensate for a lack of the optimum characteristics in the strip steel you require for your manufacturing needs? If you are "making do" with slit-sheet products or mill-run strip because you don't know that The Cold Metal Products Company is equipped to develop specifications and produce the exact size, tolerance, structure, finish, or temper most adaptable for your particular need alone, then this message is intended to bring us together. The "unusual" specification is our business and what's more we are prepared to study your problems and make recommendations for specifications which you may not know are available but which well may be commonplace with us.

Our message is simply this—If you are having fabricating problems with cold rolled strip steel, if the labor cost represented in your rejects is a cause for concern, or if your assembly costs are high because of quality variations in your strip steel components, give us an opportunity to show you what CMP strip steel products can do for you.

the Cold Metal Products co.
 YOUNGSTOWN 1, OHIO

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LOW CARBON, HIGH CARBON (Annealed or Tempered) STAINLESS AND ALLOY GRADES, ELECTRO ZINC COATED ARE AVAILABLE FROM:

THE COLD METAL PRODUCTS CO. of CALIFORNIA, 6600 McKinley Avenue, Los Angeles

Phone: Pleasant 3-1291

THE KENILWORTH STEEL CO., 750 Boulevard, Kenilworth, New Jersey

Phones: N. Y., COurtlandt 7-2427; N. J., UNionville 2-6900

PRECISION STEEL WAREHOUSE, INC., 4425 W. Kinzie, Chicago • Phone: COlumbus 1-2700

PRICES: Copper Blows Off Its Ceiling Lid

Ceilings die for ores, concentrates, mill products of copper and aluminum . . . Copper price leaps upward . . . Ends shaky scrap situation for brass mills . . . Aluminum prices steady.

Copper and aluminum producers this week are finding themselves in an atmosphere free of government price restrictions for the first time since Jan. 25, 1951. And copper, true to pre-decontrol predictions, shot up in price while aluminum held to OPS levels.

Price lids on these metals, their ores, concentrates and mill products at all levels of production and distribution were ended last week. Steel, nickel, magnesium and some lesser metals were left under ceilings. Included in the decontrol package were bolts, nuts, screws, rivets, mechanical precision springs, stampings, and screw machine products.

Specifically excluded in the liberating order from Office of Price Stabilization were wire nails and brads. The order was the fourth major price decontrol action taken by OPS within a month and left about 11 pct of the items on the government's cost-of-living index still behind full price barriers.

Relieve Sluggish Situation

Commenting on the recent package issued by his agency, Price Stabilizer Freehill said ceilings on copper and aluminum were abandoned to relieve a "serious supply situation" stemming from the sluggish flow of these vital metals to users.

According to Freehill's estimate, last week's decontrol order affected metallic items that amount to about \$4 billion per year in sales volume.

Following decontrol the copper industry was thrown into further confusion. But it was a much desired confusion and the industry

slowly started work toward clearing up loose ends and eliminating the multi-price mess.

Copper had been expected to shoot up in price as soon as controls were eliminated—and the market complied. Pegged by OPS at 24½¢ per lb for the main producers, the red metal shot up to a range of 27½¢ to 32¢ within hours of the decontrol action.

Producers continued quoting on a "price at time of shipment" basis for newly mined copper.

On Monday Anaconda Copper Mining Co. established a price of 32¢ per lb. One custom smelter had earlier fixed the same price, with other smelters following suit.

Brass mills were put into an

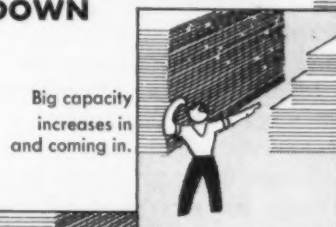
untenable position with the decontrol of scrap metal on Feb. 12. They could not raise their prices, nor could they afford to pay the high prices for copper scrap which were established immediately upon its decontrol.

Brass Mills Howl

And much copper scrap was being held back in anticipation of even higher prices as soon as primary copper would be freed. This choked off the flow of scrap and threatened to shut down the brass mills. The mills were quite vocal about this situation and obviously were able to convince Washington of the difficulty.

No. 1 copper wire scrap prices were established at 29¢ to 29½¢ per lb delivered to refineries by the middle of the week. This was a jump of about 10¢ from the OPS ceiling. At this price level, the

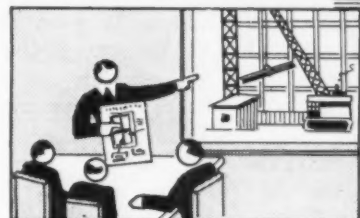
KEEPING ALUMINUM DOWN



Big capacity increases in and coming in.



Softness in some mill items.



Industry trying to build future market demands.

PUSHING COPPER UP



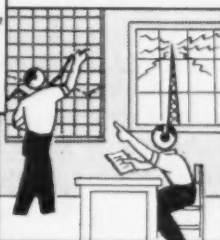
Scrap not coming out.



High foreign price.



Supply-demand balance coming slowly.



Special ceilings for same producers.



flow of copper scrap is expected to increase sharply.

Outlook is that copper prices may rise still further, perhaps even as high as the Chilean price of 36½¢ per lb delivered Connecticut Valley. But then, with sup-

See p. 214 for latest developments and prices on nonferrous metals.

plies slowly closing the gap with demand, the price is expected to settle back to about 29¢.

There has been some talk of an increase in the Chilean price but this is generally discounted in the trade. It's felt that demand is not high enough to warrant such a boost and that the present Chilean price may well prove too high for buyers in the near future.

Aluminum Balance Coming

Freeing of aluminum prices won't have much effect on the market. OPS had allowed ceiling increases since last summer totaling 1½¢ per lb for primary pig and ingot and 9.2 pct on mill products. These hikes very nearly gave producers the amount they needed to ease the impact of rising costs and huge capital expenditures for new capacity.

Now that a free market has returned, normal conditions will tend to hold prices down. Vast increases in capacity and the end of the drought which caused losses as high as 20,000 tons a month are moving aluminum nearer supply-demand balance.

Several items, such as foil, cable, tubing, powder, paste and some extrusions are on the easy side and, in some cases, were already selling below ceiling.

Seek New Markets

Sheet and strip are the tightest items and delivery is running anywhere from 4 to 6 months. But under CMP most consumers made sure they got in their orders with plenty of lead time and not many are yelling about the long delivery.

Another factor tending to hold aluminum steady is the selling attitude of the producers. Despite its size, the industry is still young and growing and producers are aware of the necessity of building

Decontrol Scoreboard

List of commodities and products decontrolled by OPS in Amend. 42 to General Overriding Reg. 9 includes:

ALUMINUM:

- primary pig and ingot
- alumina and bauxite
- powder and paste
- all mill products
- all woven wire products

COPPER:

- ores and concentrates
- blister and matte
- primary refined (all shapes)
- powder
- all brass mill products
- all wire mill products
- all woven wire products

FASTENERS:

- bolts, nuts, screws, rivets
- (not wire nails and brads)

AND:

- mechanical precision springs
- stampings
- screw machine products

future markets. They realize that to increase prices might slow the acceptance of aluminum for some of the huge markets at which they are aiming.

Net result for the light metal may be only a few minor price adjustments in mill products, both up and down, to eliminate some of the inconsistencies that cropped up as a result of the straight percentage boosts.

Although many producers in the fasteners industry want increases ranging from 7 pct. to 10 pct. they say it would be ridiculous to even think of upping the price structure because competition is so keen.

They also point out that tradition invariably leads fasteners people into price reduction. When volume falls off, prices go down.

Right now business is good in this area because the automotive industry can't get enough bolts, nuts, and other types of fasteners. A few producers in some areas complain that freight rates make it impossible for them to compete in the Detroit market.

Generally, however, most pro-

ducers are riding the Detroit wave and believe they will continue to do so through the third quarter.

Steel supply picture here has brightened somewhat but there is still plenty of room for improvement. Medium carbon items are really tight.

Low carbon steel and small rods have eased a little.

Won't Talk on Steel

In capsule form fasteners people say this—prices will remain stable for some time unless steel prices go up. Competition is the key to the whole situation.

The question of steel decontrol remained unanswered after the action of Feb. 25. At that time Mr. Freehill said only that his agency would try to continue the package system of dropping controls, but he would not name the items for inclusion in the next list.

As the list of materials no longer under price ceilings expands, it becomes more apparent that a close watch on the items included is going on "upstairs." Office of Defense Mobilization, for example, is taking considerable interest in controls generally and has a consultant, James F. Brownlee, examining problems in the regulatory field.

Bill on Standby Power

Congressional attention was directed toward controls last week by the action of Sen. Homer E. Capehart, R, Ind., and 11 other members of the Senate Banking Committee, who introduced a substitute bill (S. 1081) which would give the President emergency power to freeze prices, wages, and rents.

Sen. Capehart, the committee chairman, said the measure would permit the President to invoke a 90-day freeze giving Congress time to write controls legislation.

The Indiana lawmaker is an advocate of enacting a standby controls law (THE IRON AGE, Feb. 19), though he has not asked for continuation of controls in their present form. His new bill takes the place of his previous bill (S. 753). Only a more elaborate controls measure.

ACCIDENTS: How to Plan Against Them

Butler Mfg. Co. uses two forms, monthly summary . . . Foremen are safety teachers . . . Dangers spotted easily . . . Accident costs measured accurately, down 42 pct—By K. W. Bennett.

Everybody wants a safety program that will cut costs. Two questions are startlingly evident to the plant owner: (1) How do you set up such a program? (2) How do you evaluate its cost?

The program inaugurated at Butler Mfg. Co., Kansas City, is an excellent case in point. Using only two forms, and a summary of their contents, Butler manufacturing executives and supervisors can detect the causes of accidents, the resulting injuries and time lost.

Comparison's a Cinch

Statistics can easily be gathered and evaluated by a company employee on part time, though Butler has safety directors at each of its five plants. Each department foreman or supervisor has a monthly report that indicates his departmental accident cost as compared with the national average.

This tells him where his greatest accident causes lie, and what injuries offer the greatest potential danger.

Butler added accident analysis to the safety program about 5 years ago. Results are impressive. In 1951, the average employee worked 82.2 hr per injury dollar spent. In 1952, he worked 116.9 hr per injury dollar spent—a reduction of 42 pct for injury costs.

Use Two Forms

Monthly tabulations indicate that greatest potential sources of danger are materials handling (37 pct of total injuries) and hand tools (15 pct of total injuries). And from the cost standpoint, machinery operation accidents were 25 pct of total costs, materials handling 11.5 pct.

How is it possible to prepare this detailed and current analysis of accident trends as they occur? Only two forms are used. One is

the Dept. of Labor Report of Injury form. The other is the Butler Mfg. Co. Departmental Injury Classification and Cost Record.

The first is a standard form. The second lists employee name, date injured, days lost, injury classification and injury cost. The latter

knows immediately what danger spots to watch immediately as they begin to develop. The system keeps the foreman fully cognizant of his safety responsibilities.

Accident analysis has reduced lost time frequency by 56.8 pct. National average for similar industries is 26.1 pct. At Butler's Kansas City plant this has been brought down to 7.39 pct.

The three forms give the safety program direction and impetus. How then does the actual program work? The new employee receives a short indoctrination talk on

How Safety Program Works

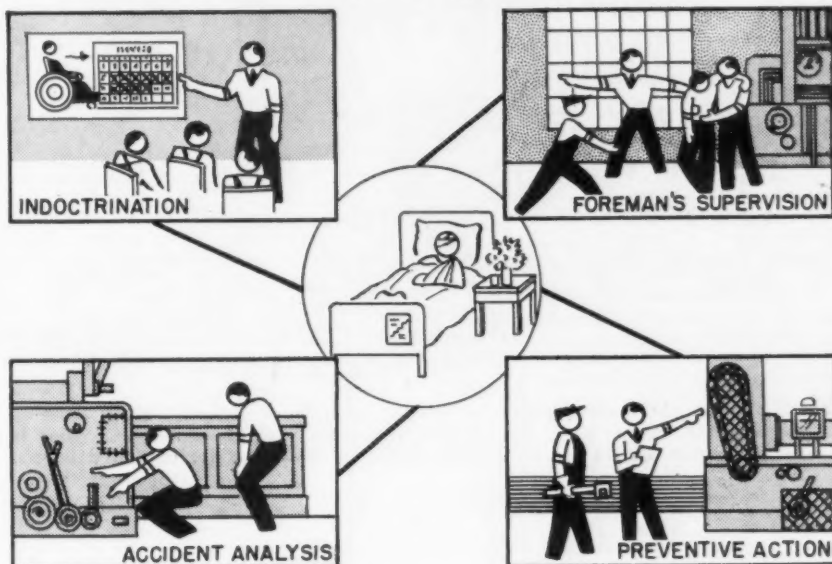


figure is the total of compensation paid and medical costs.

Injury classification is a basic in the program. Injuries are given code numbers that indicate (1) source of the injury and (2) area of the body affected.

The source of the injury can thus be traced to handling material, working surfaces (as an oily floor), flying particles, hand tools, stepping on or striking stationary objects, machines, hot or corrosive materials, health hazards (dusts, fumes, gases, etc.) electricity, highway vehicles or factory mobile equipment that requires an operator such as a crane.

The departmental foreman, receiving the monthly summary (which would be form No. 3)

safety. From then on, besides the usual posters and company inspections, safety indoctrination is largely the foreman's job.

Foremen meet at 2-week intervals for lectures and demonstrations. Meetings are held during working hours. Once each month foremen, supervisors, and executives hold a dinner meeting.

A foremen's safety council checks on departmental accident rates and discusses ways to cut them. And a labor-management safety committee has been set up.

The Butler safety program has many aspects, but the heart of it is accident analysis. It is a low cost method of reducing accident cost that can be applied to any company with good results.

ATOMS: When Will You Use Them?

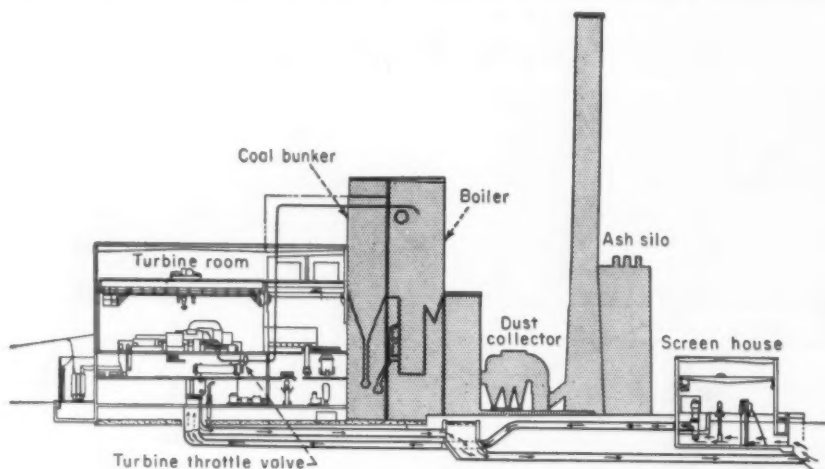
Projected Westinghouse plant raises question of how soon atomic power will be used commercially . . . Public utilities do most research . . . Cost main factor—By J. B. Delaney.

Westinghouse Electric Corp.'s plans to build a multi-million dollar plant near Pittsburgh to manufacture atomic equipment raises the question of when atomic energy will be applied commercially.

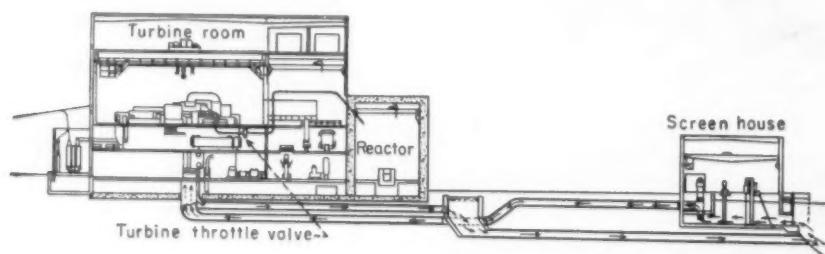
Fact that Westinghouse is making a major investment of private

be built in a few years which could furnish economic power to the systems if weapon-grade plutonium were produced and bought by AEC at Hanford costs."

From a technological standpoint it is believed that a power plant using nuclear energy as a source



SHADED AREA above shows portion of new St. Clair Thermal Electric Power Plant of Detroit Edison Co. which might be replaced by nuclear heat power reactors. Below is present conception of how nuclear reactors might be substituted for coal fired boilers.



Source: Society of Automotive Engineers

capital is viewed as an indication that this company, at least, feels that non-military application of nuclear energy may not be too far off in the future.

Probably the farthest advanced research project at the present time is that of public utility companies and other industries on the feasibility of a power plant in which atomic energy would be used in place of coal, oil, gas, or water.

Atomic Energy Commission says its latest reports on this project "indicate that large reactors might

of heat might be built in 5 to 10 years. But economics will be the controlling factor in determining whether an atomic power plant will be built. Such a plant must at least be competitive from a cost standpoint with present methods of power generation.

Walker L. Cisler, president of Detroit Edison Co., puts it this way:

"The economic problem which really is before the electric power systems may be stated briefly as follows—How can heat energy

from a nuclear reactor be delivered to the point of utilization at a cost equal to, or less than, heat energy from the conventional gaseous, liquid, or solid fuels now used?"

Mr. Cisler believes that as a source of heat energy alone atomic fission "is unlikely to be commercially successful in the foreseeable future without assurance of additional revenue from the sale of atomic by-product materials like plutonium."

Investment Limit Higher

Using his company's St. Clair power plant as a starting point, Mr. Cisler estimates that under ideal conditions the limit of investment in an atomic power plant would be approximately \$227 per kw compared with an investment of \$77 per kw in the conventional plant. This assumes there would be no fuel, operation, and maintenance expense in the nuclear unit.

Assuming that purified uranium as a fuel source could be obtained at no cost, an investment of \$227 per kw of reactor capacity would be justified, according to Mr. Cisler. "But with increasing cost of the purified uranium, the justified investment would decrease."

When the cost reaches \$56 per lb the justified investment in a nuclear reactor installation would drop to \$77 per kw. If the cost rose to as much as \$83 per lb no investment could be justified.

Won't Tell Products

The Westinghouse plant will be situated on a 40-acre plot in Har-mar Township, near Pittsburgh. It is expected to be ready for occupancy by late fall of 1953. Initial employment will be 200.

Specific products to be manufactured were not mentioned. But Westinghouse has developed many unusual types of equipment in the last 5 years while building an atomic power plant for the first atom powered submarine.

Under the atomic energy law products of the new plant must go to government atomic projects. AEC says it will ask Congress to change the law if industry can come up with a workable plan for use of civilian reactors.

AUTOS: Keep Steel Market Tight

Detroit biggest source of pressure for steel . . . High output keeps inventories bare . . . Conversion continues . . . Quota death gamble paid off, but dearly—By R. D. Raddant.

The hand of the automotive steel buyer is applying the pressure to keep the steel market tight.

Bolstered by some of the highest production schedules in history, the automobile industry is consuming sheets and bars at a terrific rate. This rate promises to hold up the market long after the time when most experts predicted, in that time-honored cliché: "Steel will be coming out of our ears."

Inventories Don't Exist

That situation has not appeared and apparently is not in the immediate future. Conversion, which others predicted would be washed up last November, is continuing. Steel buyers are still at their wits' end to procure sheets for tomorrow's schedules. Inventories in the auto industry are nearly non-existent.

Automakers are not holding up the market on their own shoulders, but there is little doubt but that they are playing the leading roles in the steel drama today.

First quarter and first half schedules are exceeding those of the record breaking 1950 rate. But what makes the current situation critical is that today's production still suffers from the effects of the 1952 steel strike.

They Took A Chance

When the strike ended, automakers scheduled every car they could to make up for lost time. With holdover tickets, they could press for every piece of steel available. Then, at the start of 1953, a new race featuring new models got underway. And this time, automakers took a gamble.

In spite of NPA quotas that limited production to 1,250,000 cars for the first quarter, auto-

makers scheduled rates that reached over 1,500,000 passenger cars. Gamble was that controls would end before the quarter's quotas were reached. It paid off in full production when needed.

This production had its price. Some auto plants were forced to obtain as high as half of their

What They Need

Steel requirements for 1 week passenger car production, in tons, based on 124,000 cars and American Iron and Steel Institute estimates:

Hot-rolled bars	33,250
Cold-rolled bars	5,062
Wire products	11,687
Pipe and tube	625
Structural shapes	1,875
Hot-rolled sheet and strip	103,250
Cold-rolled sheet and strip	60,250
Plate	2,812
Terneplate	2,687

steel from expensive conversion or foreign sources, at nearly twice the cost of mill steel. Even the Big Three, with vast procurement sources, had to go to expensive lengths to maintain desired schedules.

If this production rush had occurred with full inventories, the market would still have been tight. But it happened when stocks were bare and when it was impossible to obtain inventories.

Now that production controls are off, the sky is the limit. Last week, passenger car production reached 124,101 cars, the highest weekly rate since April 1951.

This means that about 221,500 tons of steel are pressed, forged, stamped and assembled in 1 week

into cars in automotive plants. This includes about 103,250 tons of hot-rolled sheet and strip, 60,250 tons of cold-rolled sheet and strip, 33,250 tons of hot-rolled bars, and 5,062 tons of cold-rolled bars. This does not include truck demands which probably claim about 25 pct of the steel needed for passenger cars.

In 1950, the auto industry's biggest year, it consumed about 21.8 pct of all steel tonnage. This figure is probably being paralleled today. If first and second quarter projected schedules continue, the industry will build 1.5 million cars the first quarter and 1.7 million in the second quarter.

Won't Break Records

Although this will be a first half record, annual production is not expected to climb to the peak 6,672,141 figure reached in 1950. That year, production soared in the second half. This year it is expected to taper off in the early fall until model introductions start late in the year.

In this market, all kinds of pressure are being exerted at the mill level to avoid the expensive conversion deals that are the curse, from the purchaser's point of view, of a tight market.

Since conversion reached its peak in the early days of Korea, automotive companies have assisted in financing steel industry expansion to avoid a repetition of the tight steel market.

Put Up Cash

Probably the biggest instance is General Motors investing \$40 million at 3 pct interest in Republic Steel to be repaid in specified steel products.

General Motors also authorized a loan of \$28 million to Jones & Laughlin to help finance the Ohio Works at Cleveland. This loan is repayable in monthly installments related to production.

Chrysler and Packard extended a \$10-million option to borrow to Pittsburgh Steel as part of a \$60-million expansion bundle. To date, this has not been picked up, al-



THIS PICTURE TELLS A STORY of a new cost-cutting opportunity for steel mills

Note the ready accessibility of each item of steel in this storage yard of a well-known steel mill. It's this availability of materials that's one of the prime advantages of the ROSS STRADDLE CARRIER handling method . . . an advantage, unmatched by any other method, that eliminates delays, lowers costs and increases the production efficiency of the mill.

ROSS STRADDLE CARRIERS, heart of the Ross unit-load handling system, are built to handle 45,000-pound concentrated loads on around-the-clock schedules in the roughest, toughest steel mill service . . . to put those loads *where* wanted *when* wanted.

Your mill, too, can profit by this modern, flexible mass handling system. Get in touch with Ross today for the complete details.



THE ROSS CARRIER COMPANY

Direct Factory Branches and Dealers Throughout the World

425 MILLER ST., BENTON HARBOR, MICH., U.S.A.

Manufacturing

though the other \$50 million has. Under this agreement, Chrysler, which put up \$8 million, has call on 200,000 tons of steel per year. Packard has claim to 50,000 tons.

It is a matter of general gossip in Detroit that automotive companies are on the verge of floating \$100 million to a Detroit electric steel mill for construction of ore docks, blast furnace and open-hearth capacity. Ford has had its own mill at the Rouge for many years which produces about half of Ford's requirements. Kaiser-Frazer has a link with Republic because of a Cleveland blast furnace deal.

More Gray Iron Castings Asked

Office of Defense Mobilization is ready to issue tax amortization certificates to cover an additional 160,000 tons of capacity for gray iron castings of 3000 lb and over.

This expansion goal, to be completed by July 1, 1954, is in addition to the 1952 estimated total annual capacity figured at 16 million tons for the whole gray iron castings industry.

Approximately 30 pct of production is chewed up by the machine tool industry. While the foreseeable demand for lighter castings is apparently sufficient, not enough foundries are able to turn out the larger sizes of up to 25 or more tons which would be needed for increased mobilization, ODM says.

ODM will consider two kinds of applications — addition to or modification of existing facilities, or construction of new plants.

Glass Protects Exhaust Systems

The U. S. Navy is reported using glass-coated steel and alloy equipment on snorkel submarines, PT boats and other craft. Special glass, supplied by the Pfaudler Co., Rochester, N. Y., is sprayed on and fused at high temperature.

Inside and out coatings give corrosion protection to submarine exhaust piping and mufflers for surface craft. Pfaudler claims the coating will not crack or spread and can be damaged only at a point of considerable impact.

ORE: Inland Rents Steep Rock Field

Leases 1200 acres for 99 years in Canada's iron ore rich Steep Rock Lake area . . . Hopes for 3 million tons annually . . . Plans \$50 million development program in next 7 years.

Without wandering far afield in search of overseas iron ore deposits, Inland Steel Co., Chicago, claims to have secured its ore future for many years by leasing for 99 years 1200 acres of ore land in northwest Ontario's Steep Rock Lake area.

Agreeing to pay its landlord, Steep Rock Mines, Ltd., royalties on a percentage of the market value of ore it ships, Caland Ore Co., Inland subsidiary, plans to sink \$50 million over 7 years. It hopes for eventual production of 3 million tons per year. Attractive too is the advantageous location of the orebody.

Quality Is Good

After a period of extensive drilling and exploring Inland firmed up its agreement with Steep Rock. According to Inland Vice-President Philip D. Block, Jr., the company expects to swap its \$50 million for at least 50 million tons of ore indicated in the area.

Quality and structure of the ore are excellent, Inland states. The company expects the ore to assay at 53 pct Fe, but points out that test drillings are good only for about 1000 ft.

When full production is reached Inland's underground mines at Steep Rock should be turning out 3 million annual tons of iron ore. For a steel company with 4.5-million-tons rated steelmaking capacity, acquisition of such a shipping volume spells raw materials security. Yet, the titans in the steel business must still look far afield for more sizable deposits. They have gone overseas and deeper into Canada.

As a fully integrated company, Inland besides owning its own reserves of coal, ore, and limestone operates a fleet of boats on the Great Lakes. These carriers will load Steep Rock ore from the Canadian National Dock at Port Arthur—a port 120 miles nearer Inland's Indiana Harbor mills than Superior, Wis. From Superior comes Mesabi Range ore. On each round trip each Inland ship will save almost a day.

Steep Rock Iron Mines properties lie 140 miles west of Port Arthur on the main line of the Canadian National Ry. between Port Arthur and Winnipeg. Caland will link its ore field to the railroad with a 3- or 4-mile spur.

Situated in the Falls Bay area of Steep Rock Lake, Caland's 1200 acres are called "C" orebody,

which was made accessible since 1943 by diverting the course of the Seine River and dredging the lake.

For Steep Rock Iron Mines, Inland's leasing of the ore field means good long-term royalties and perhaps stimulation of interest in other ore zones still "vacant." Under the terms of the lease Inland is loaning Steep Rock \$8 million repayable after mining operations have started. With this loan Steep Rock can now invest further in developing its own new iron ore mines.

Remove the Overburden

Although Inland has been poking around on ore exploration missions in Canada for over 20 years this is its first entry as a Canadian shipper. Drilling and exploring on Inland's leased area will continue through the winter and the major undertaking of bringing the Caland mines into production will begin as soon as possible. Removing overburden to expose the ore body for mining (probably underground) is the first phase of the project.

Producing ore continuously since 1944 from its "B" orebody in the middle section of the drained and dredged lake, Steep Rock Mines is now developing "A" orebody and the newly found "G" zone.

Open pit mining in the "B" field last year yielded 1,275,000 tons of ore. In the same orebody an underground mine will open output this year. Another in the "A" field will also start this year.

Steep Rock's shipping record started in 1944 when 16,552 gross tons were shipped. In 1945, shipments shot over half a million and then rose to about the present level.

Inland Steel has been exploring and drilling its area for 3 years.

Ore Routes Compared



READING: Stop Wasting Your Time

Executives find need for faster reading, turn to development courses . . . Previous training usually inadequate, too elementary . . . Practice boosts speed—By G. G. Carr.

Take a look at your mail. In addition to the usual flood of letters, ads, memos, it probably contains a couple of newspapers, a rash of magazines, an occasional book or two, and a shower of releases, pamphlets, broadsides, etc.

Management personnel spend about 15 hr a week just reading. And in many jobs you may well spend more. But how much of it is wasted?

Should Read Faster

Tests show the average business-man reads only slightly better than an eighth-grade schoolboy—and that's still above the national level. Trouble is, few people have ever received any reading training after elementary school.

More and more executives are aware of this handicap, are turning to reading development firms like The Reading Laboratory in

New York and Chicago's Foundation for Better Reading. These groups specialize in training executives to read faster, better.

Goal of the 20-hr course is a reading speed of 650-700 words per min. National average is about 250 words. Many taking the course do far better: A Chicago lawyer got up to 3750.

Reading Lab Director Kenneth P. Baldrige points out that reading speed will, of course, vary with the difficulty of the material. But you can read even legal and scientific matter faster with proper training.

What They Do

Lab procedure starts off with an eyesight check, follows with photos of eye motion.

The Lab also uses a battery of diagnostic tests to determine vocabulary level, reading speed and

comprehension, and reading mechanics. Experts stress that anyone's reading can be improved.

While professional guidance and special equipment is needed for difficult cases and major advancement, Reading Lab personnel point out you can progress on your own.

A good vocabulary is essential to reading skill. As a business executive your own is well above average now, but there is always room for improvement. There are several good systems now on the market if you feel you need them. Tests show, incidentally, a high correlation between vocabulary level and general executive ability.

Read Phrases, Not Words

Biggest trouble for most slow readers is that they still read as they were taught as kids—word for word. Fast readers have gone on, learned to read phrase by phrase: **TheIronAge**, not **The—Iron—Age**.

Reading specialists suggest you try practicing this, say you'll be surprised how quickly you get the hang of it. The Reading Lab uses an ingenious device, the tachistoscope, to train clients.

This gadget, similar to one used to train air raid spotters, flashes first numbers, then phrases on a screen for a split-second.

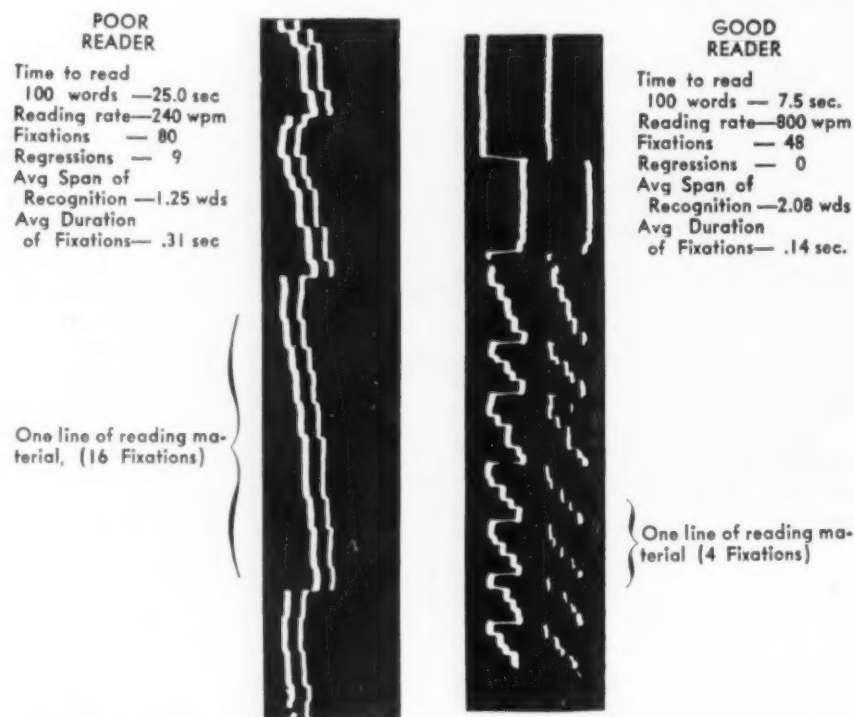
Anticipate the Author

Anticipating the author is a valuable **time-saver**: General MacArthur asked a stronger stand in Asia; President Truman pointed to NATO commitments in

Many words have little real meaning, serve mainly as mental comfort stations.

Important thing is to waste no time on non-essential words. Try to read only the boldface words and phrases in the next paragraph:

Another way to make yourself read faster is to read vertically, zigzagging slightly as you go. This is one kind of **skimming**, is best used on newspapers and magazines with narrow columns. Reading down the middle of the column you can pick out the key words and phrases without getting stuck in verbal complexities.



PHOTOGRAPHS of the eyes of good and poor readers point up the differences in reading mechanics. Note that the good reader pauses less, never goes back.

Mobilization

NEW PLANES:

USAF orders turboprops . . . Navy testing variable wing jets.

Both the Air Force and the Navy have announced plans for respective firsts. The first cargo and transport plane designed for turboprop engines is on the Air Force procurement list and the Navy is testing what may become the first combat plane with a variable sweep wing.

Wings of the Grumman F-10F jet fighter are set at right angles to the fuselage for take-off, but can be swept back in flight at an angle similar to that on the Air Force F-86 fighter. For landing they can be returned to a straight-across position.

Wait for Okay

Navy spokesmen say the F-10F is "planned for production," but add that the final decision is still to come.

Other novel-type aircraft now being tested or in early production stages for the Navy include a delta-wing fighter and turboprop and jet attack bombers.

Rear Adm. John B. Moss, assistant chief of the Bureau of Aeronautics, said recently that a decision made shortly after the Korean fighting began has paid off. The decision, he stated, was to concentrate on high-quality equipment instead of numbers, and "we are beginning to get the new stuff."

Combines Jet and Prop

Turboprop transport planes that the Air Force says will fly higher and faster than any troop and cargo aircraft now in use will be built by Lockheed Aircraft Corp.

The Air Force declines to say how many planes of this type, designated as the C-130, it has ordered, nor has it announced the load capacity or other pertinent data. The four turboprop engines combine jet propulsion with conventional propeller thrust.

As yet there is no production model of the C-130. Lockheed is building prototypes at Burbank, Calif., and will go into quantity production later at Marietta, Ga.

Transportation



Cat Moves Tower 300 Yards

Build a new water tower or move the old one at half the cost? Mr. E. Ingerslev elected to move the old 1900-ton water tower, when the Bedford Rural District Council, in England, gave him the choice.

Using a Caterpillar D-7 tractor as motive power, and multiplying its 5-ton pull to 50 tons with a 10 to 1 block and tackle, Mr. Ingerslev moved the huge structure 300 yd to a new site.

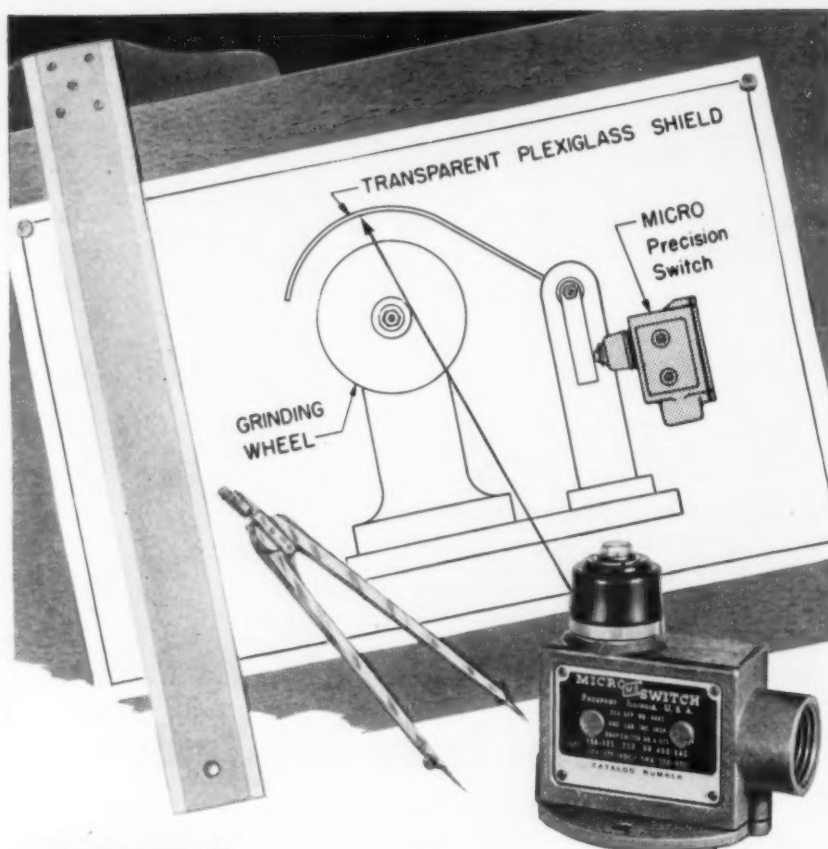
Ordinary bullhead section rails were laid as track. The sections were laid on their sides, and 800 2.5-in.-diam steel balls were used as bearings to support the heavy load. Paired ball races were supported in pre-cast concrete blocks 6 ft wide at the base and 2 ft wide at the top.

The concrete block rig spread the load over the full width of two concrete roads that consisted of a 4-in. layer of concrete over a hard core base that had been rolled into the clay subsoil. Cradles were pre-stressed concrete beams 6 x 2 ft.

First section of track was built through the base of the tower. Tower supports were then cut away until the full base rested on the cradles. The cat was used to pull the tower, then unhitched and used to bring the rails behind the tower up in front of it again as it moved along its 300-yd journey. Full trip and setup time for the moving rig took 4 weeks.

Standard bullhead railway line and 2 1/2-in. steel balls provided the four ball races upon which the 1,900-ton tower was towed.





MICRO switch says "no grinding" unless protecting shield is over the wheel

HERE's a safety use of a MICRO precision switch for almost any plant, protecting eyes and face of grinding wheel operators from flying particles.

Plexiglass shield is linked to the plunger actuator of the MICRO switch which only closes the power circuit when the shield is in the "down" position.

This application of a MICRO switch to a universal plant problem is just one of hundreds of uses that plant engineers, electricians and operating men are finding for these versatile switches.

As limits, safeties and interlocks, they make existing equipment safer, more efficient and more productive. They are available for bottom and side mounting and with actuators to take any kind of actuating motion.

Ask for them at your local authorized MICRO distributor. You will find him under "switches, electric" in your classified telephone book. MICRO field engineers are located in principal cities, too, to assist in the solution of complex switch problems. Call your nearest MICRO branch office.

MICRO A DIVISION OF
MAKERS OF PRECISION SWITCHES MINNEAPOLIS-HONEYWELL REGULATOR COMPANY
FREEPORT, ILLINOIS



Research

JETS: Tested on Icy Mountain

North America's worst weather makes peak a perfect test station . . . Engineers have TV.

The best location in North America for consistently bad weather. That's what General Electric Co. wanted for running tests of jet engines under severe icing conditions. And it looks as though they've found it on the summit of Mt. Washington, N. H.

Dubbed "Misery Mountain" by its engineer inhabitants, the 6240-ft peak is just about ideal—for its purposes. Fog prevails for 340 days during the year, wind hits 75 to 110 mph for 4 months (highest recorded was 230 mph), and the temperature has dropped as low as minus 46° F.

Chain It Down

Because of these rugged conditions living quarters and test station must be well anchored, literally chained to the mountain.

But these conditions, which are stormier than the polar icecap, closely simulate those that affect jet engines when planes begin land-



PARKA-CLAD engineers making adjustment to GE J-47 turbojet before a rugged cold weather test.

on Icy Mountain Perch

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FROSTING isn't sweet, just cold on Mt. Washington test station.

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ing approaches. The high moisture, low temperature and 6240-ft altitude is just right for checking icing conditions of jets as they let down.

In tests of prototype engines the engineers determine the operating conditions under which the engine will begin to ice up. Essentially, they work out maximum operating conditions for Air Force and Navy pilots as well as checking to find if engines meet specifications.

Another job done in Misery Mountain's lab was the development and checking of instruments for detecting aircraft engine icing.

Built for Transmitter

Jointly operated by the Air Force and the Navy, the laboratory was originally built as a radio transmitting station.

Weather observation, meteorological experimentation and arctic clothing testing is also carried out on the mountain. And a bit downhill is another laboratory doing research on aerial ice formation.

But living quarters in the frigid aerie aren't bad at all. The ice-bound station boasts leather furniture, a tile bath, electric blankets, oil heating, glass brick partitions, and even a television set.



Let the "Wyandotte" man Give YOU the sensational PRE-FOS PERFORMANCE STORY



SPEEDED PHOSPHATING 50%!

"Wyandotte PRE-FOS cleans better; deposits a fine-grained phosphate coating which helps hold paint and prevent rust. PRE-FOS speeds up our phosphating 50%; is cheaper and lasts longer."
*Detroit, Michigan**



SUCCEEDED WHERE OTHER PHOSPHATING CLEANERS HAD FAILED!

"In our operation, we had previously tried most of the other available phosphating cleaners with only partial success. But we have found that PRE-FOS gives us superb paint adhesion, excellent cleaning and rust protection. Wyandotte PRE-FOS has proved completely successful."
*Chicago, Ill.**

Other reports on Pre-Fos:

"We now run one to two weeks longer before dumping!"

"Humidity cabinet resistance improved 80%!"

"Best cleaning our washer has ever produced!"



Largest manufacturers of specialized cleaning products for business and industry.



Wyandotte
CHEMICALS

Helpful service representatives in 138 cities in the United States and Canada



CUT COSTS UP TO 75%!

"With Wyandotte PRE-FOS we get better cleaning and paint adherence, elimination of hard-water scaling. Our cost formerly was four times as great as it is now with PRE-FOS!"
*Canton, Ohio**



ELIMINATED ONE PRODUCTION STAGE!

"PRE-FOS enabled us to completely eliminate one stage in our operation. We cut production time, saved valuable shop space, obtained better cleaning and paint preparation."
*Detroit, Michigan**

Call in your Wyandotte service man today. Ask him to show you how amazing PRE-FOS can help you. Send the coupon for more PRE-FOS information. Wyandotte Chemicals Corporation, Wyandotte, Michigan. Also Los Angeles 12, California. **Name's on request*

Wyandotte Chemicals Corporation
Wyandotte, Michigan

Please send data on PRE-FOS:

Name _____

Firm _____

Address _____

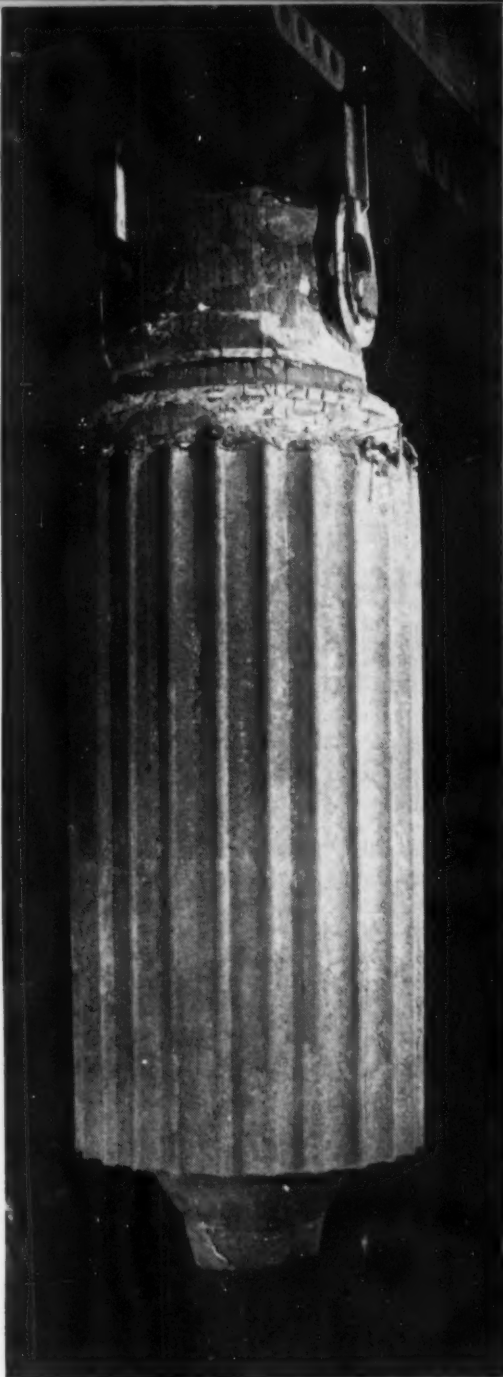
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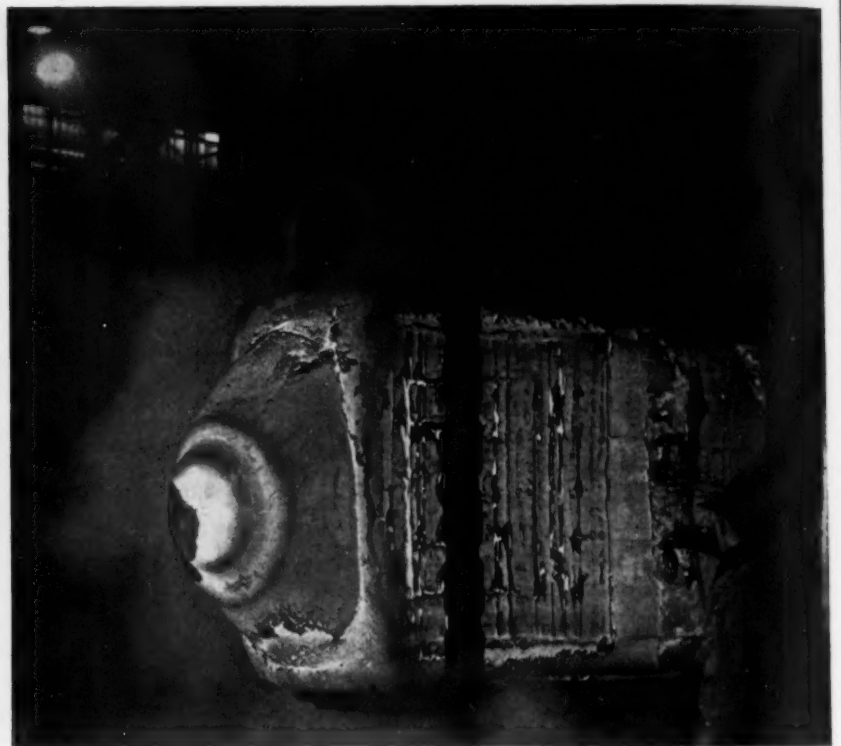
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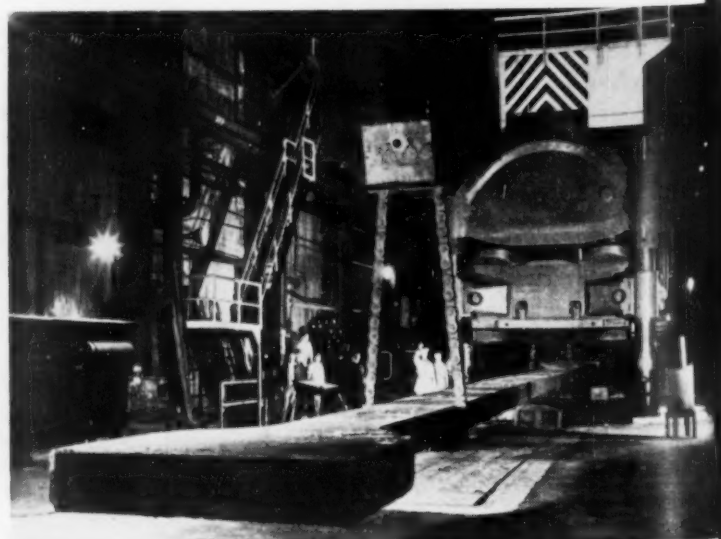
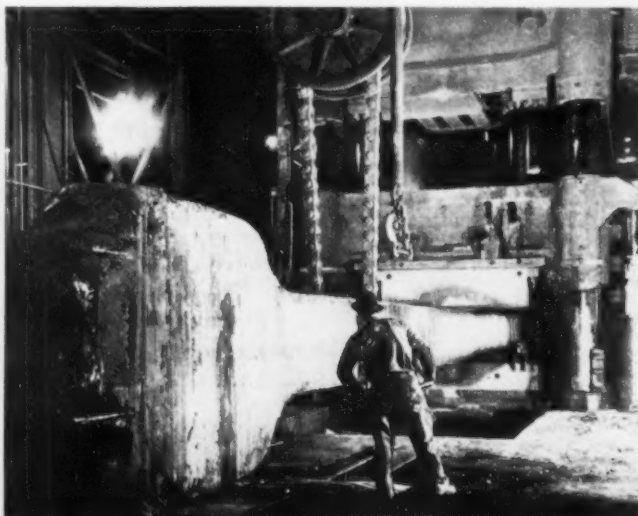


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SECOND OF FIVE forging heats in 7500-ton press. Once-round ingot has been forged into rectangular shape and is now being elongated by press.

↓ FOURTH FORGING HEAT reduces main body of section to 44 in. in length.



FINAL STRAIGHTENING is accomplished in 6500-ton press.

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No sign of material decontrol policy . . . Aluminum products makers side with steel industry, ask complete decontrol by Apr. 30 . . . Oppose priority system for military orders.

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On the contrary, it seemed that the government wants more time to come to a decision on the pressing question of advance allotments. Meanwhile, says the Office of Defense Mobilization, "all allotments" remain in full force.

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The industry also asked for a definite green light to go ahead and book unrated orders after June 30 on an unrestricted basis. As it stands industry doesn't know if it is permitted to accept unrated orders for third quarter.

Give us an immediate, clear-cut, legal ruling on the matter, the industry urged.

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Nearest thing to a definite policy statement comes from Acting ODM Director Arthur S. Flemming, who says CMP won't be continued after June 30.

But, he adds, whatever "statutory authority" is provided will be "used vigorously to assure completion of the military build-up." As to advance allotments, he has this to say:

"Advance allotments of steel, copper, and aluminum under CMP for delivery after June 30 are being re-examined. All such allotments which do not meet military and defense requirements will be cancelled within the next few weeks.

"Until cancelled, all allotments continue in full force and effect."

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But, representatives of the industry who met with the government last week were unanimously opposed to use of a priority system. They recommended that whatever control system is used to guarantee military orders should include time and quantity limitations.

Still another recommendation was that authority be delegated to a specific government agency to make sure of delivery of aluminum to independent fabricators in accordance with requirements of the industry's expansion contracts with the government.

A major reason for urgency for

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And, under Dir. 20 to CMP Reg. 1, there is not much space available for second quarter acceptance of unrated orders, the industry declared.

Set Scrap Export Quota

A first quarter export quota of 49,579 short tons of steel scrap has been set by the Office of International Trade.

This includes 41,315 tons of steelmaking scrap, 6164 tons for lead smelting, and 2100 tons of copper precipitation scrap.

Practically all of the steelmaking scrap is being set aside and shipped to Mexico for steel operations, traditionally dependent upon the U. S. for scrap supplies.

The first quarter quota is roughly 13,000 tons above the amounts permitted for each of the third and fourth quarters of 1952. But in addition to the quota announced last week, small additional amounts will be permitted for export to meet specific hardship cases.

IRON & STEEL: January Output By Districts

As Reported to the American Iron and Steel Institute

DISTRICTS	BLAST FURNACE —NET TONS	Number of Companies	Annual Capacity	PIG IRON		FERROALLOYS*		TOTAL			
				Jan.	Year to Date	Jan.	Year to Date	Jan.	Year to Date	Pct of Capacity	
										Jan.	Year to Date
Eastern.....	12	16,312,990	1,205,012	.....	.....	27,653	.....	1,232,665	.....	88.9	.....
Pitts.-Yngstn.....	16	28,643,120	2,406,476	.....	.....	47,929	.....	2,454,404	.....	100.9	.....
Cleve.-Detroit.....	6	8,633,800	723,872	.....	.....	.....	.....	723,872	.....	98.7	.....
Chicago.....	7	16,251,250	1,318,322	.....	.....	.....	.....	1,318,322	.....	95.5	.....
Southern.....	8	6,020,380	489,604	.....	.....	6,721	.....	486,325	.....	97.0	.....
Western.....	3	3,518,700	338,793	.....	.....	.....	.....	338,793	.....	113.3	.....
TOTAL.....	34	79,380,240	6,482,061	.....	.....	82,302	.....	6,584,363	.....	97.3	.....

DISTRICTS	STEEL —NET TONS	Number of Companies	Annual Capacity	TOTAL STEEL (Incl. Alloy Steel, Carbon Ingots)		Pct of Capacity		ALLOY STEEL		CARBON INGOTS	
				Jan.	Year to Date	Jan.	Year to Date	Jan.	Year to Date	Jan.	Year to Date
Eastern.....	23	23,863,810	1,935,358	.....	.....	95.5	.....	169,706	.....	465,240	.....
Pitts.-Yngstn.....	35	43,621,000	3,832,760	.....	.....	103.4	.....	560,225	.....	480,579	.....
Cleve.-Detroit.....	8	12,002,900	948,962	.....	.....	93.1	.....	79,907	.....	92,819	.....
Chicago.....	16	24,960,600	2,097,771	.....	.....	98.9	.....	170,248	.....	307,809	.....
Southern.....	12	6,036,160	485,750	.....	.....	94.7	.....	6,476	.....	3,221	.....
Western.....	12	7,063,000	596,026	.....	.....	99.3	.....	10,606	.....	24,348	.....
TOTAL.....	85	117,547,470	9,896,627	.....	.....	99.1	.....	997,170	.....	1,374,014	.....

* Includes Ferromanganese, Spiegel and Ferroilicon.

Cut Your Gas Bill Up To **ONE-HALF!**



PILOT-LIGHT FLAME

- Saves gas... saves time
- Full "pre-set" heat instantly
- No re-adjustment
- No re-lighting

MARQUETTE

MODEL H

INSTANT HEAT AUTOMATIC Welding Torch

With Marquette's new "Instant Heat" automatic torch, you light once, adjust once... and let the pilot light burn between welds. Press the lever... you get full flame instantly. Release it, and it cuts automatically to a tiny pilot flame, saving up to one-half on gas. Marquette's Instant Heat Automatic Torch is a precision-made instrument, embodying such features as "O"-Ring seals, full tip swivel, stainless steel heat barrier. Write for complete information.



MARQUETTE

REG. IN U. S. PAT. OFFICE

*Welding & Automotive
Service Equipment*



MARQUETTE MANUFACTURING CO., INC.
307 E. Hennepin Avenue • Minneapolis 14, Minnesota

Industrial Briefs

New Arm . . . LINDBERG ENGINEERING CO., Chicago, will open its new West Coast plant at 11937 S. Regentview Ave., Downey, Calif., on Mar. 25.

Welding Clinic . . . STEEL SALES CORP., Chicago, will hold a 3-day welding clinic in conjunction with the formal opening of its new warehouse at 2185 N. Sherman Drive, Indianapolis, beginning Apr. 15.

Making History . . . KROPP FORGE CO.'s unfilled tonnage backlog is the highest in its history. Operations at Kropp Forge Ordnance Co., Melvindale, Mich., are at an alltime peak with shipments running at approximately \$1 million per month.

Big Move . . . NATIONAL CAN CORP. has moved its headquarters to Chicago from New York City. New office is at 3217 W. 47th Place.

Converted . . . HARBISON-WALKER REFRACTORIES CO. has completely converted its Warm Springs, Calif., plant for the production of chemically bonded basic refractories.

Doing Better . . . BECKMAN INSTRUMENTS, INC., South Pasadena, Calif., reports that operations in the first half of the 1953 fiscal year resulted in a sales increase of 88 pct over volume for the same period last year.

More Service . . . A. O. SMITH CORP., Milwaukee, has opened a new service branch at Oakland, Calif., for its Product Service Div. George A. Carlson is manager.

New Prexy . . . CAST IRON SOIL PIPE INSTITUTE has elected J. W. Struve, president of Rich Mfg. Co. as its president for 1953.

New Office . . . WESTINGHOUSE ELECTRIC CORP., Pittsburgh, has established an Atlanta branch office with Thomas Fuller, Jr., as branch manager.

Annual Conference . . . THE TECHNICAL SOCIETIES COUNCIL OF NEW JERSEY, INC., will hold its Third Annual Conference at the Essex House, Newark, N. J. J. A. Kearney, Crucible Steel Co., P. O. Box 32, Harrison, N. J. will handle reservations.

Cease and Desist . . . FEDERAL TRADE COMMISSION has ordered officers and members of the Chain Institute, Inc., to discontinue "entering into agreements or understandings to fix or maintain prices, terms or conditions of sale for chains or chain products."

Contract Awarded . . . WORCESTER PRESSED STEEL CO., Worcester, has been awarded a contract by the Ordnance Corps, Dept. of the Army, for a study of the forming properties of titanium.

Acquired . . . THE THOR CORP. Chicago has acquired the Leeson Steel Products Co., New Albany, Ind. The newly acquired company will continue operation as a wholly owned subsidiary of Thor.

Distributor . . . ALLIS-CHALMERS MFG. CO., Milwaukee has named the Acushnet Electric Supply Co., Inc., at 240 N. Water St., New Bedford, Mass., a distributor.

Ring That Bell . . . Carboly Dept. of GENERAL ELECTRIC CO. Detroit has scheduled the first session of the year of its school on the use of tungsten carbide tools in wood-working for May 4th.

Alltime High . . . CLARK EQUIPMENT CO., Buchanan, Mich., reports company earnings and sales were the highest for the 12 months that ended Dec. 31, 1952 in its 50-year history.

Sales Dealer . . . CLEARING MACHINE CORP., Chicago appointed the Saterlee Co. as a distributor in Minneapolis and the northern counties of Wisconsin.

Almost Ready . . . THE RUST ENGINEERING CO., has almost completed construction of a new Shelbyville, Ind., facility for Fiber Glass Div. of Pittsburgh Plate Glass Co.

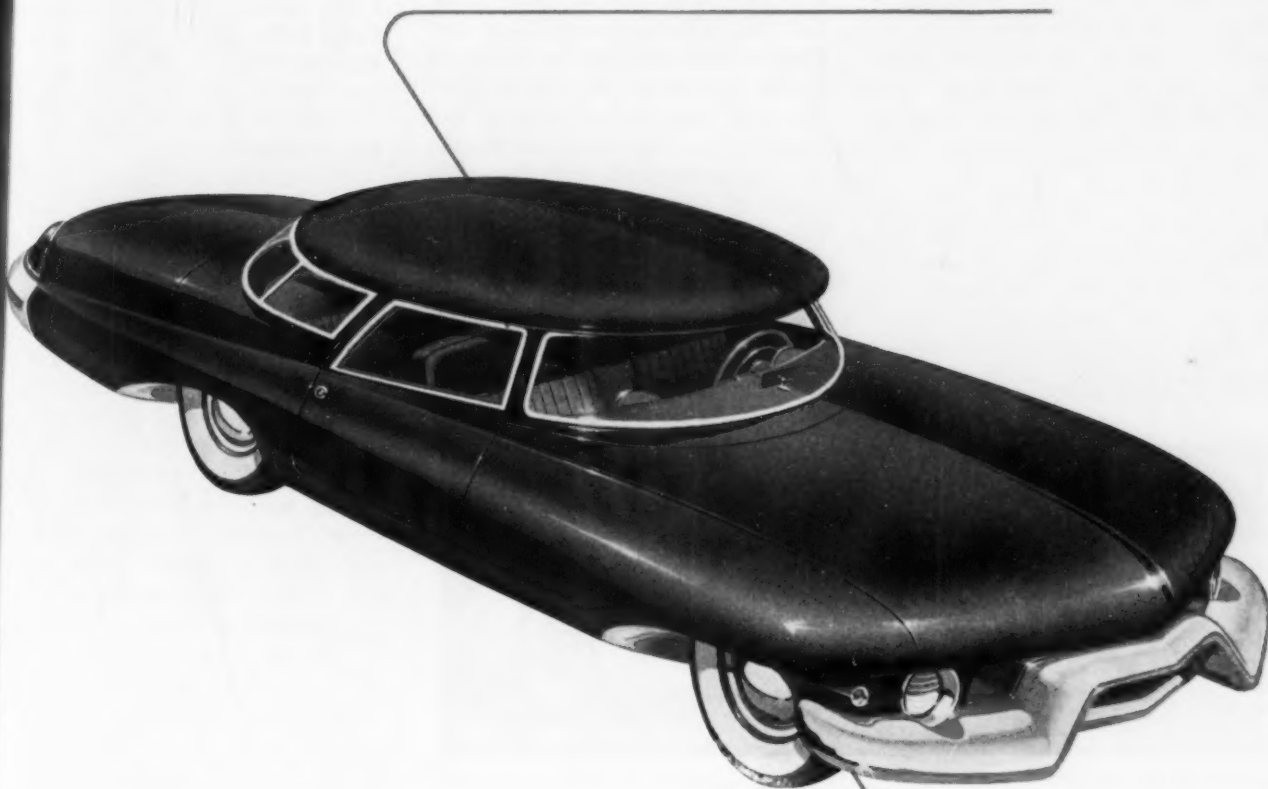
Merger . . . INLAND STEEL CO. Chicago, reports that Inland Steel Container Co., a wholly-owned subsidiary corporation since 1939, became a division of the parent company effective Mar. 1.

At Your Service . . . TEXAS EASTERN TRANSMISSION CORP. has opened its new 14-story office building in Shreveport, La.



Specify

for **Lighter Weight**
Longer Life
with **Economy**



N-A-X HIGH-TENSILE, having 50% greater strength than mild carbon steel, permits the use of thinner sections—resulting in lighter weight of products. It is a low-alloy steel—possessing much greater resistance to corrosion than mild carbon steel, with either painted or unpainted surfaces. Combined with this characteristic, it has high fatigue and toughness values at normal and sub-zero temperatures and the abrasion resistance of a medium high carbon steel—resulting in longer life of products.

N-A-X HIGH-TENSILE, with its higher physical properties, can be readily formed into the most difficult stamped shapes, and its response to welding, by any method, is excellent. Due to its inherently fine grain and higher hardness, it can be ground and polished to a high degree of lustre at lower cost than can mild carbon steel.

Your product can be made lighter in weight . . . to last longer . . . and in some cases be manufactured more economically, when made of N-A-X HIGH-TENSILE steel.

KEEP YOUR SCRAP MOVING TO YOUR DEALER

MAKE A TON OF SHEET STEEL
GO FARTHER
Specify



... And
"MAKE YOUR PRODUCT
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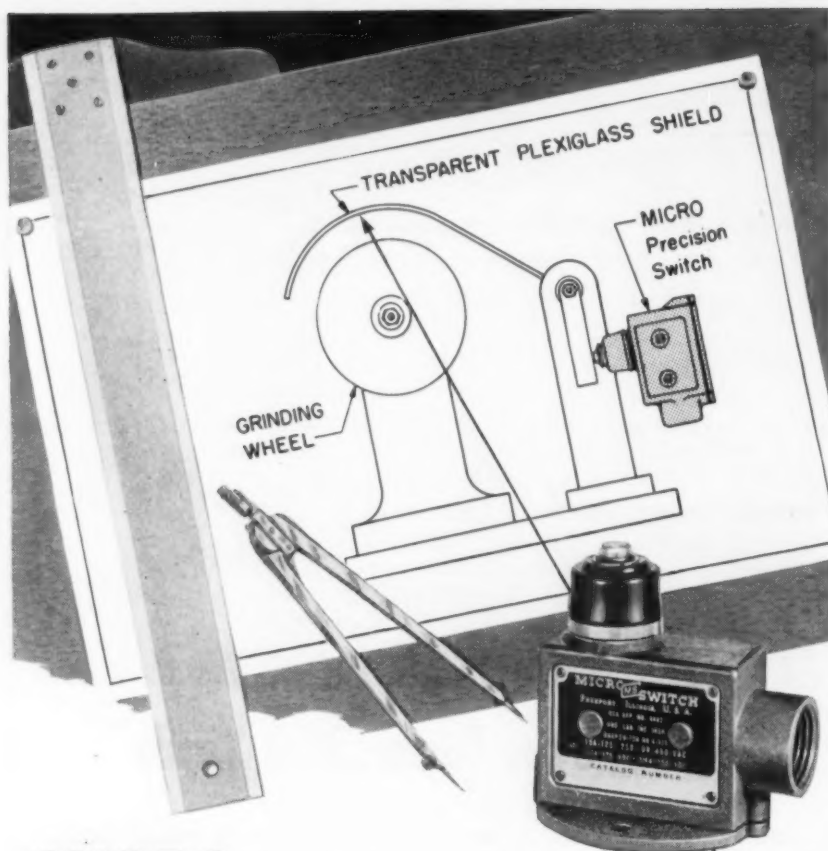
GREAT LAKES STEEL CORPORATION

N-A-X Alloy Division

Ecorse, Detroit 29, Michigan

NATIONAL STEEL CORPORATION





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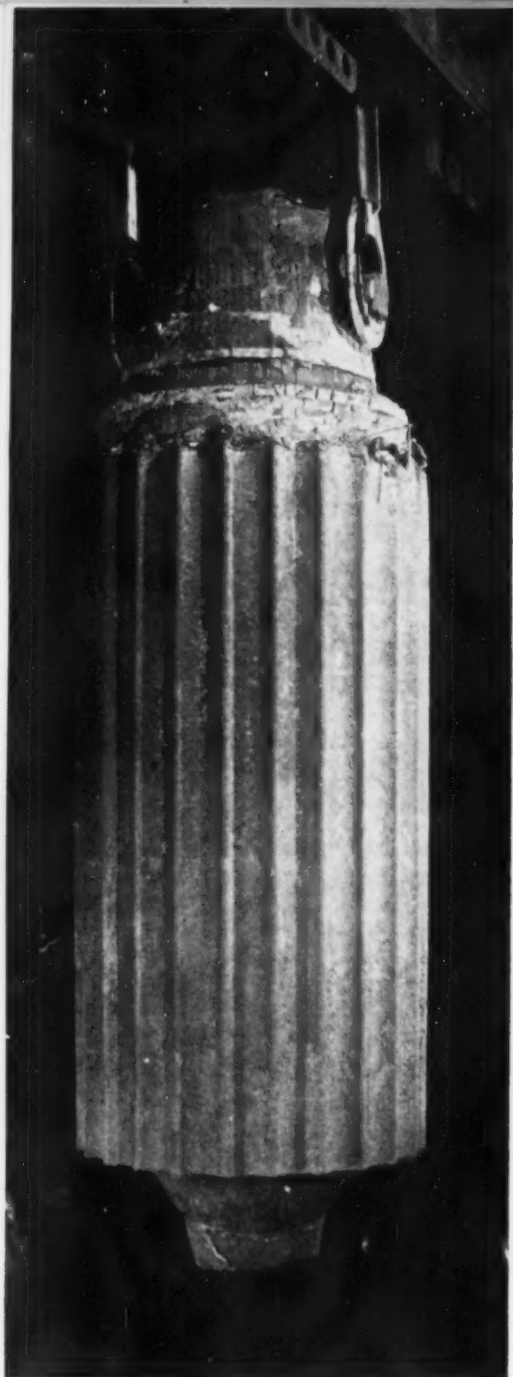
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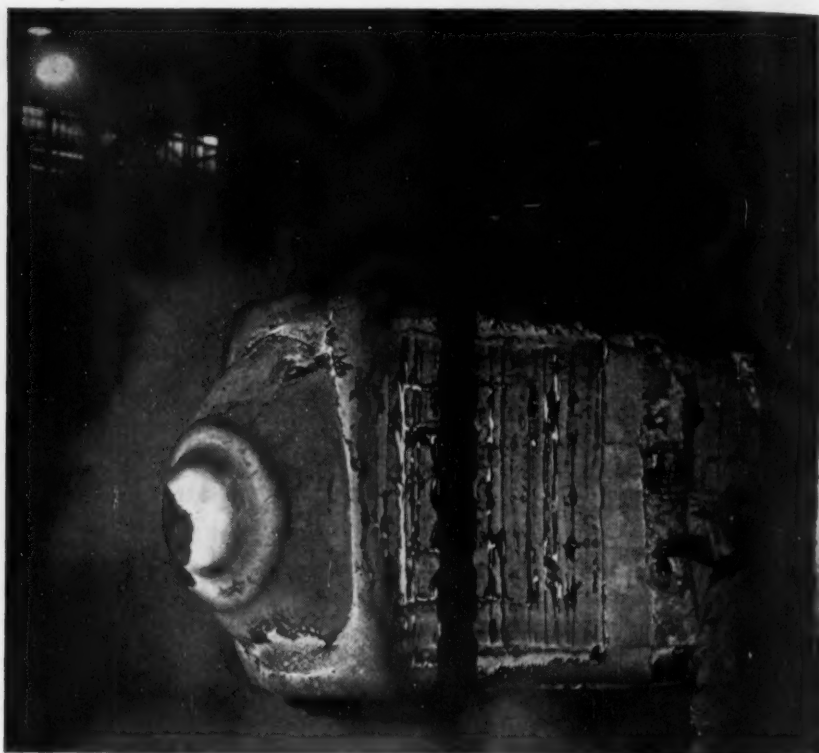
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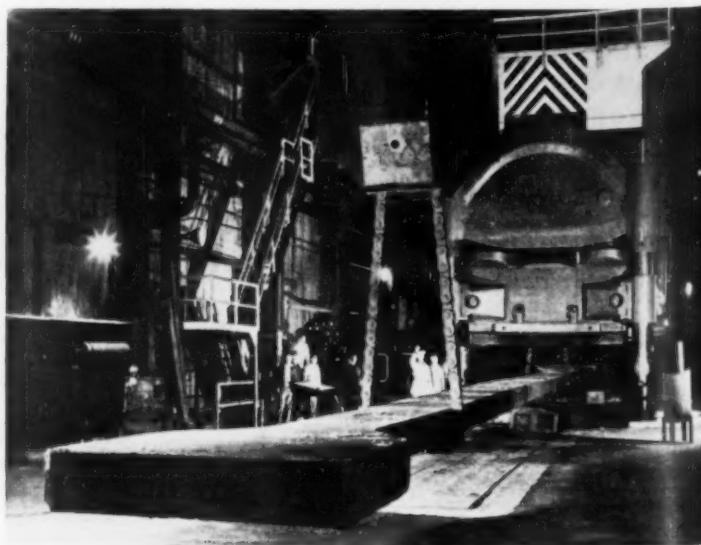
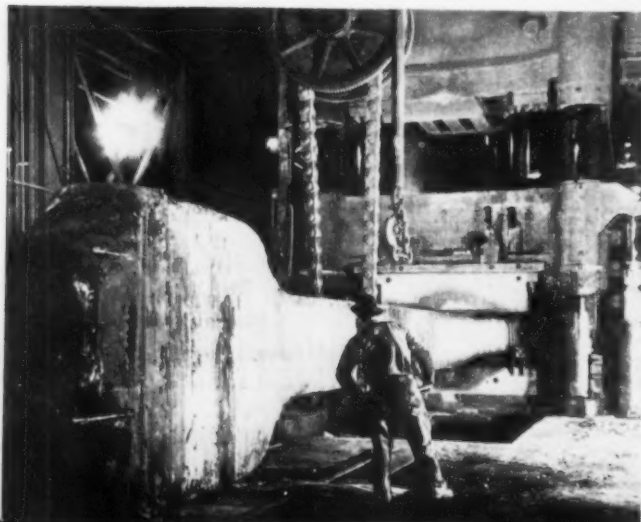


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A first quarter export quota of 49,579 short tons of steel scrap has been set by the Office of International Trade.

This includes 41,315 tons of steelmaking scrap, 6164 tons for lead smelting, and 2100 tons of copper precipitation scrap.

Practically all of the steelmaking scrap is being set aside and shipped to Mexico for steel operations, traditionally dependent upon the U. S. for scrap supplies.

The first quarter quota is roughly 13,000 tons above the amounts permitted for each of the third and fourth quarters of 1952. But in addition to the quota announced last week, small additional amounts will be permitted for export to meet specific hardship cases.

IRON & STEEL: January Output By Districts

As Reported to the American Iron and Steel Institute

DISTRICTS	Number of Companies	Annual Capacity	PIG IRON		FERROALLOYS*		TOTAL		Pct of Capacity	
			Jan.	Year to Date	Jan.	Year to Date	Jan.	Year to Date	Jan.	Year to Date
Eastern.....	12	16,312,990	1,205,012		27,653		1,232,665		88.9	
Pitts.-Yngstn.....	16	28,943,120	2,406,476		47,928		2,454,404		100.9	
Cleve.-Detroit.....	6	8,633,800	723,872				723,872		98.7	
Chicago.....	7	16,251,250	1,318,322				1,318,322		96.5	
Southern.....	8	6,020,380	489,604		6,721		496,325		97.0	
Western.....	3	3,518,700	338,795				338,795		113.3	
TOTAL.....	34	79,380,240	6,482,081		82,302		6,564,383		97.3	

DISTRICTS	Number of Companies	Annual Capacity	TOTAL STEEL (Incl. Alloy Steel, Carbon Ingots)		ALLOY STEEL		CARBON INGOTS	
			Jan.	Year to Date	Jan.	Year to Date	Jan.	Year to Date
Eastern.....	23	23,863,810	1,935,358		95.5		169,706	485,240
Pitts.-Yngstn.....	35	43,621,000	3,832,760		103.4		560,225	480,579
Cleve.-Detroit.....	8	12,002,900	949,982		93.1		79,907	92,819
Chicago.....	16	24,960,600	2,087,771		98.9		170,248	307,809
Southern.....	12	6,036,160	485,750		94.7		8,470	3,221
Western.....	12	7,063,000	596,026		99.3		10,608	24,348
TOTAL.....	85	117,547,470	9,896,627		99.1		967,170	1,374,014

* Includes Ferromanganese, Spiegeleisen and Ferroaluminum.

Digest of Industry Controls

Chemicals—Revoc., M-32 eliminates the order providing lead times for rated orders of chemicals as well as percentages of production that must be provided for rated orders.

Conversion Steel—Amend., Dir. 3, M-46A, and Amend., Dir. 5, M-46 extend through the second quarter self-authorization authority for oil and gas operators to obtain and use finished carbon conversion steel.

Copper, Aluminum — Amend. 42, GOR 9 removes price controls from copper and aluminum metals, ores, concentrates and mill products.

Consumer Goods—Amend. 18, Rev. 1, GOR 4, Amend. 16, Rev. 1, GOR 5 remove manufacturer's ceilings on thousands of consumer goods previously decontrolled only at wholesale and retail levels and also eliminate at manufacturing, wholesale and retail levels price ceilings on a wide area of additional consumer items not listed in the former general retail regulation, CPR 7.

Industrial Services — Amend. 40, GOR 14 eliminates controls on practically all consumer, commercial and industrial services; on warehousing, storage, dock, terminal and all transportation services, and on brokerage fees and agency commissions charged for exempted commodities.

Nonferrous—GOR 43 permits producers, processors and manufacturers to pass along the higher costs of

beryllium, chromium, cobalt and nickel.

Steel—Amend. 2, CPR 156 clarifies the coverage of GPR 156 which concerns ceiling prices of fabricated structural steel, miscellaneous and ornamental iron and vessel shop products for field assembly.

Contracts Reported Last Week

Including description, quantity, dollar values, contractor and address. Italics indicate small business representatives.

Reishauer tooth flank, 6, \$254,754, Cosa Corp., New York.
Boring machines, 14, \$209,480, The Heald Mach. Co., Worcester, Mass.
Cutting outfits oxyacetylene, 510, \$91,208, Welder's Service Co., Pittsburgh.
Spare parts for P2V aircraft, var, \$95,462, Lockheed Aircraft, Burbank, Calif., J. S. Card.
Amplifier and maintenance parts for var instruments, var, \$317,319, General Elec. Co., Philadelphia.
Pump assays for var aircraft, var, \$161,861, Lear, Inc., Elyria, Ohio.
Maintenance parts for use on AD aircraft, var, \$53,300, Douglass Aircraft Co., El Segundo, Calif., W. H. Hough.
Generator, tachometer, 1859 ea, \$77,552, Jack & Heintz, Inc., Cleveland.
Fan assy for HUP-2 aircraft, 144 ea, \$288,382, The Benson Mfg. Co., Kansas City, Mo.
Spare parts, var, \$83,020, Barber-Greene Co., Aurora, Ill.
Spare parts, var, \$96,583, R. G. Le Tourneau, Peoria, Ill.
Loader, scoop type, 26 ea, \$327,241, International Harvester Co., Melrose Park, Ill.
Parts for 20 MM gun automatic M24A1, 6000, \$118,810, Buffalo Arms, Inc., Akron, N. Y.
Lights, polarity, 432 ea, \$57,268, Oakland Mfg. Co., New York.
Motor generator, 30, \$147,028, Bogue Electric Mfg. Co., Paterson, N. J.
Motor Generator, 51, \$106,029, Miehle Printing Press & Mfg. Co., Bloomfield, N. J.
Bearing, line shaft, spring bearing, 34, \$89,655, American Metal Bearing Co. of Calif., Los Angeles.
Forced draft blower, 7, \$61,618, Westinghouse Elec., Washington.

Replenishment of tank and combat vehicle parts, 45800, \$10,000, Borg-Warner Corp., Muncie, Ind.
Replenishment of hardware, 1699550, \$95,000, St. Pierre Chain Corp., Worcester, Mass.
Replenishment of tools, 47435, \$355,800, Chase Brass & Copper Co., Inc., Waterbury, Mass.
Replenishment of tank and combat vehicle parts, 17700, \$80,552, General Motors Corp., Detroit, R. C. Campbell.
Replenishment of tank and combat vehicle parts, 60000, \$159,000, Varney Heat Treating Co., Detroit.
Primer, percussion, 18170, \$486,915, Bridgeport Metal Goods Mfg. Co., Bridgeport, Conn.
Fuze, 880000, \$8,404,000, U. S. Time Corp., Waterbury, Conn.
Cart, tracer, cal. .50, 5471000, \$1,800,506, Winchester Repeating Arms Co., New Haven, Conn.
Cart, ball, carbine, cal. .30 M1, 30500000, \$1,425,875, Winchester Repeating Arms Co., New Haven, Conn.
Primer, percussion M40A1, 1005100, \$350,779, Bruner-Ritter Co., Inc., Bridgeport, Conn.
Fin, shell, 350000, \$163,625, The Greist Mfg. Co., New Haven, Conn.
Casing gurnter M8, 642000, \$259,368, Bruner-Ritter Co., Inc., Bridgeport, Conn.
Primer percussion M58, 6428, \$268,039, Eagle Lock Co., Terryville, Conn.
Reflector, barrel, cal. .30, 265,000 ea, \$28,726, Commonwealth Plastic Corp., Leominster, Mass.
Motor metal parts for 3.5" rocket head, 293500, \$8,174,750, Ford Motor Co., Dearborn, Mich., F. B. Christian.
Shell, HE, M107, 155 MM, 127500, \$4,253,400, Canadian Commercial Corp., Washington.
50 M/M cartridge cases, \$136,495, E. W. Bliss Co., Canton, Ohio.
Sight, unit, M34A1, 3630, \$866,408, Auto-Soler Co., Atlanta, Ga.

Construction

Steel Inquiries and Awards

Fabricated steel awards this week include the following:

184 Tons, Bridgewater and Raynham, Mass., three bridges, J. F. Fitzgerald Construction Co., Boston, Mass., low bidder.
107 Tons, near Kingston Junction, Tenn., four-deck gutter spans for Tennessee Valley Authority railroad bridge to American Bridge Div. of U. S. Steel, Birmingham, Ala.

Reinforcing bar awards this week include the following:

104 Tons, Bridgewater and Raynham, Mass., three bridges, J. F. Fitzgerald Construction Co., Boston, Mass., low bidder.

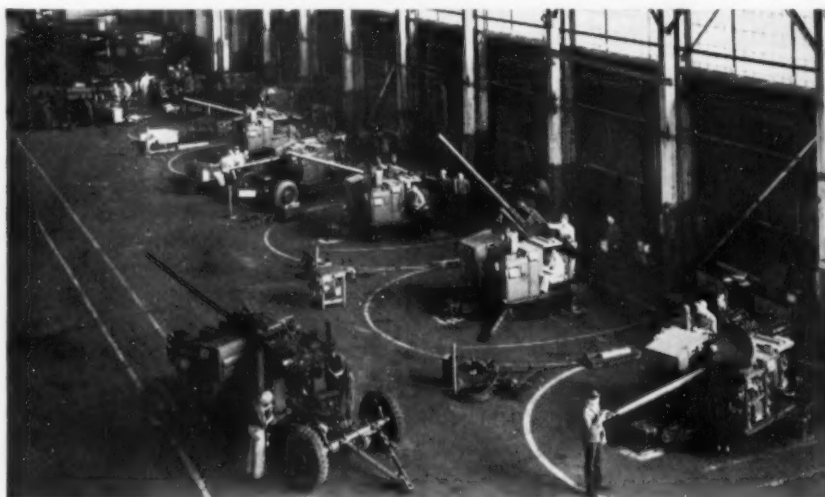
January bookings of fabricated structural steel, as compiled from reports received by the American Institute of Steel Construction, amounted to 268,163 tons, an increase of 14% over December 1952, and 26% over the corresponding month of last year.

Shipments for January totaled 234,234 tons up 4% over the previous month when 225,161 tons were shipped in December, 1952. While below the same month of last year, January shipments were 6% greater than the average monthly rate of 222,021 tons shipped during 1952.

The backlog of work ahead as of January 31 stands at 2,179,777 tons.

A tabulation showing the detailed figures for January is given below.

Estimated Total Tonnage for the entire industry				
CONTRACTS	1953	1952	Avg. 1947-1950	
CLOSED				
Total Tonnage				
January	268,163	213,110	161,976	
SHIPMENTS				
January	234,234	244,947	166,910	
TONNAGE OF BACKLOG	2,179,777	2,416,042	1,237,286	
Percentage scheduled for production within the next four months				
(To May 31)	49%	46%	56%	
Percentage scheduled for production after the next four months				
(From June 1)	51%	54%	44%	



ARMY ANTIAIRCRAFT gun, 75mm Skysweeper aimed by radar and computer, is in final assembly stage at Elwood City plant of Aetna Standard Engineering Co. It may be answer to fast jet jobs. Radar, computer and gun are mounted integrally.

Job costs ARE FIGURED ON A SQUARE FOOT BASIS
WHILE *material* IS PURCHASED ON A WEIGHT BASIS

18 gauge x 36" x 120"
= 63.00 lbs. (theoretical)



Here's how *MicroRold* Stainless Steel SAVES you money

In the use of stainless steel, the selection of gauge number is usually determined by the minimum permissible thickness having sufficient strength to meet the requirements of the application. When you receive material on the heavy side of the gauge you are paying a premium for stainless surface area.

When sheets are ordered by gauge number, the permissible A. I. S. I. variation in thickness is plus or minus 10%. Thus, if you order 18 gauge, you may receive sheets .052" thick, when a thickness of .0475" would suit your purpose. Using a standard 18 gauge 36" x 120" sheet as an example,

the theoretical weight is 63.00 pounds, but this weight could permissibly vary between 59.22 pounds and 65.52 pounds. Each .001" of thickness adds 1.26 pounds per sheet.

MicroRold sheets may be ordered by gauge number and you can specify they be rolled on the light side of the gauge range. This is true because the equipment is such that more accurate control of thickness is possible.

If you are not a user of MicroRold sheet it will pay you to get the full details. Your steel warehouse distributor will gladly tell you the MicroRold story.

Washington Steel

CORPORATION
WASHINGTON, PENNSYLVANIA



Cut Your Gas Bill Up To **ONE-HALF!**



PILOT-LIGHT FLAME

- Saves gas... saves time
- Full "pre-set" heat instantly
- No re-adjustment
- No re-lighting

MARQUETTE

REG. IN U. S. PAT. OFFICE
MODEL H

INSTANT HEAT AUTOMATIC Welding Torch

With Marquette's new "Instant Heat" automatic torch, you light once, adjust once... and let the pilot light burn between welds. Press the lever... you get full flame instantly. Release it, and it cuts automatically to a tiny pilot flame, saving up to one-half on gas. Marquette's Instant Heat Automatic Torch is a precision-made instrument, embodying such features as "O"-Ring seals, full tip swivel, stainless steel heat barrier. Write for complete information.



MARQUETTE

REG. IN U. S. PAT. OFFICE

*Welding & Automotive
Service Equipment*



MARQUETTE MANUFACTURING CO., INC.
307 E. Hennepin Avenue • Minneapolis 14, Minnesota

Industrial Briefs

New Arm . . . LINDBERG ENGINEERING CO., Chicago, will open its new West Coast plant at 11937 S. Regentview Ave., Downey, Calif., on Mar. 25.

Welding Clinic . . . STEEL SALES CORP., Chicago, will hold a 3-day welding clinic in conjunction with the formal opening of its new warehouse at 2185 N. Sherman Drive, Indianapolis, beginning Apr. 15.

Making History . . . KROPP FORGE CO.'s unfilled tonnage backlog is the highest in its history. Operations at Kropp Forge Ordnance Co., Melvindale, Mich., are at an alltime peak with shipments running at approximately \$1 million per month.

Big Move . . . NATIONAL CAN CORP. has moved its headquarters to Chicago from New York City. New office is at 3217 W. 47th Place.

Converted . . . HARBISON-WALKER REFRACTORIES CO. has completely converted its Warm Springs, Calif., plant for the production of chemically bonded basic refractories.

Doing Better . . . BECKMAN INSTRUMENTS, INC., South Pasadena, Calif., reports that operations in the first half of the 1953 fiscal year resulted in a sales increase of 88 pct over volume for the same period last year.

More Service . . . A. O. SMITH CORP., Milwaukee, has opened a new service branch at Oakland, Calif., for its Product Service Div. George A. Carlson is manager.

New Prexy . . . CAST IRON SOIL PIPE INSTITUTE has elected J. W. Struve, president of Rich Mfg. Co. as its president for 1953.

New Office . . . WESTINGHOUSE ELECTRIC CORP., Pittsburgh, has established an Atlanta branch office with Thomas Fuller, Jr., as branch manager.

Annual Conference . . . THE TECHNICAL SOCIETIES COUNCIL OF NEW JERSEY, INC., will hold its Third Annual Conference at the Essex House, Newark, N. J. J. A. Kearney, Crucible Steel Co., P. O. Box 32, Harrison, N. J. will handle reservations.

Cease and Desist . . . FEDERAL TRADE COMMISSION has ordered officers and members of the Chain Institute, Inc., to discontinue "entering into agreements or understandings to fix or maintain prices, terms or conditions of sale for chains or chain products."

Contract Awarded . . . WORCESTER PRESSED STEEL CO., Worcester, has been awarded a contract by the Ordnance Corps, Dept. of the Army, for a study of the forming properties of titanium.

Acquired . . . THE THOR CORP., Chicago has acquired the Leeson Steel Products Co., New Albany, Ind. The newly acquired company will continue operation as a wholly owned subsidiary of Thor.

Distributor . . . ALLIS-CHALMERS MFG. CO., Milwaukee has named the Acushnet Electric Supply Co., Inc., at 240 N. Water St., New Bedford, Mass., a distributor.

Ring That Bell . . . Carboloy Dept. of GENERAL ELECTRIC CO., Detroit has scheduled the first session of the year of its school on the use of tungsten carbide tools in wood-working for May 4th.

Alltime High . . . CLARK EQUIPMENT CO., Buchanan, Mich., reports company earnings and sales were the highest for the 12 months that ended Dec. 31, 1952 in its 50-year history.

Sales Dealer . . . CLEARING MACHINE CORP., Chicago appointed the Saterlee Co. as a distributor in Minneapolis and the northern counties of Wisconsin.

Almost Ready . . . THE RUST ENGINEERING CO., has almost completed construction of a new Shelbyville, Ind., facility for Fiber Glass Div. of Pittsburgh Plate Glass Co.

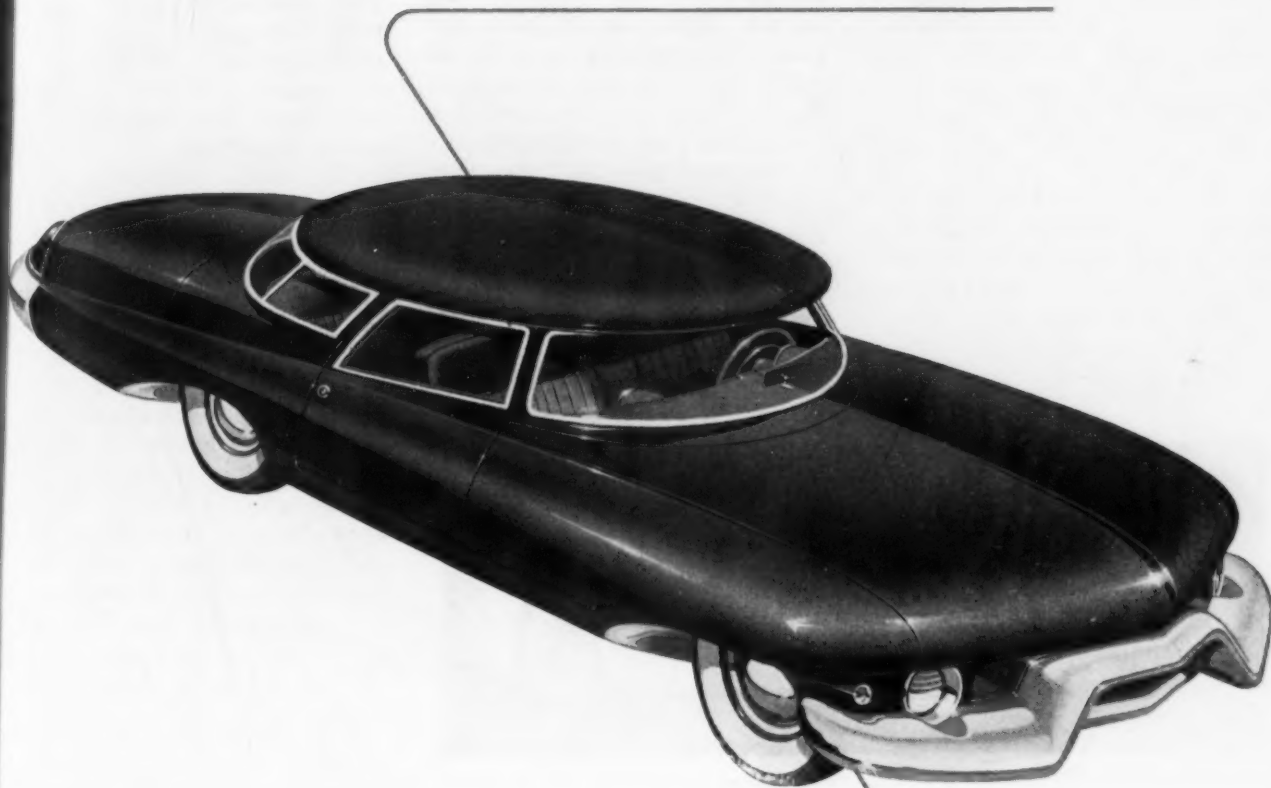
Merger . . . INLAND STEEL CO., Chicago, reports that Inland Steel Container Co., a wholly-owned subsidiary corporation since 1939, became a division of the parent company effective Mar. 1.

At Your Service . . . TEXAS EASTERN TRANSMISSION CORP., has opened its new 14-story office building in Shreveport, La.



Specify

for **Lighter Weight**
Longer Life
with **Economy**



N-A-X HIGH-TENSILE, having 50% greater strength than mild carbon steel, permits the use of thinner sections—resulting in lighter weight of products. It is a low-alloy steel—possessing much greater resistance to corrosion than mild carbon steel, with either painted or unpainted surfaces. Combined with this characteristic, it has high fatigue and toughness values at normal and sub-zero temperatures and the abrasion resistance of a medium high carbon steel—resulting in longer life of products.

N-A-X HIGH-TENSILE, with its higher physical properties, can be readily formed into the most difficult stamped shapes, and its response to welding, by any method, is excellent. Due to its inherently fine grain and higher hardness, it can be ground and polished to a high degree of lustre at lower cost than can mild carbon steel.

Your product can be made lighter in weight . . . to last longer . . . and in some cases be manufactured more economically, when made of N-A-X HIGH-TENSILE steel.

KEEP YOUR SCRAP MOVING TO YOUR DEALER

MAKE A TON OF SHEET STEEL
GO FARTHER
Specify—



... And
"MAKE YOUR PRODUCT
LAST LONGER"

GREAT LAKES STEEL CORPORATION

N-A-X Alloy Division

• Ecorse, Detroit 29, Michigan

NATIONAL STEEL CORPORATION



The Automotive Assembly Line

Lines Drawn for Sports Car Battle

Chevvie starting Corvette production, but keeps sportster plans quiet . . . Auto plastics use experimental . . . Results will set GM policy . . . Nash shows Rambler—By R. D. Raddant.

Inside dope is that Chevrolet will go into production within a few days on the new Corvette, plastic sports convertible that made its first appearance at General Motors Motorama in January.

With typical Chevrolet reticence, production plans are being kept under cover despite the fact that the Corvette will be the first plastic car on the market and the first true sports car to be offered by a major automaker.

Recently, Kaiser-Frazer's Fiber-glas DKF-161 sports car made its

What happens in this trial run may go a long way to determining General Motors future plans for plastic construction as well as policy on sports cars in general. But the fact that Chevrolet, the corporation's top producer, is taking the first jump indicates that some of these conclusions have already been formulated.

What It's Like . . . In details, the Corvette is only 33 in. high and 70 in. wide on a 102 in. wheelbase. It has a notable absence of



CHEVROLET'S CORVETTE, which is expected to go into production in the next few weeks.

first public appearance. (THE IRON AGE, Feb. 26, 1953, p. 87.) K-F is playing up the lightweight plastic body, but doesn't plan production until mid-summer. Thus Chevrolet will be the first major auto producer to enter the plastic automobile field.

Shift to Steel . . . Unofficial word is that Chevrolet will build about 300 Corvettes in plastic before changing over to steel for later Corvette production. In that sense, the Corvette is in the experimental classification as it is being built in plastic chiefly to add to the auto industry's still limited knowledge and use of plastic.

brightwork but smooth clean lines. It will have a special 160-hp stepped-up Chevrolet engine. Price is still a speculative proposition, but before leaving GM, C. E. Wilson said off the cuff that it could be built at about \$1 a lb. It weighs slightly less than 3000 lb.

Will They Last? . . . Introduction this week of the 1953 Nash Rambler line adds more fuel to the controversial issue of the role of the small car.

The history of the auto is dotted with failures of small cars to make the grade. Many fortunes were poured into design and production of small economical cars,

but one by one they dropped by the wayside. Some failed outright. Others were absorbed into larger companies, but few have lasted.

Today there are two small car lines, the Nash Rambler and the Henry J. Both are reasonably successful although together they absorbed only about 3.5 pct of the 1952 market. And at the same time, both parent companies are experimenting in flashy but low cost sports cars that may be in competition with their own products in other lines.

Made A Lot . . . In both Nash and Kaiser-Frazer, the small car took up a substantial proportion of the parent company's total business. For example, in 1952 about 52,000 Ramblers were produced compared with 55,500 Statesman cars and 44,500 Ambassadors. Kaiser-Frazer produced 30,500 Henry J's and 45,000 Kaisers.

This year the Rambler features three lines, convertible, hardtop, and station wagon. The Nash sales line is that the Rambler has the economy and ease of handling of the small car, but still includes comfort and performance features of its bigger brothers.

For example, the Rambler has an 85 hp L-head engine, choice of standard transmission, overdrive, or dual range Hydramatic. It has a wheelbase of 100 in. The convertible has an electrically operated top. Obviously, these features aren't those of a stripped down package with only the bare necessities of transportation.

Change Stress . . . Stress on these big car features is exactly the opposite of British small car philosophy. There it is assumed that a small car buyer wants the bare necessities without frills. There has never been much indication that a car of that type is in demand in the U. S. unless it has sporty features which distinguish it on the highway.

Rambler styling is based on the



**"Bill, making or losing money today
can depend on**

The Turn of a Screw!"

"Stop pulling my leg," Bill retorted skeptically.

"I'm not exaggerating. You can't afford to take your fasteners for granted," Bob insisted. "I'm saving time—and time is money—just by following the RB&W man's suggestion to use another kind of screw in my TV sets."

"What kind?" asked Bill.

"RB&W's new **SPIN-LOCK Screw**," answered Bob. "It has a patented feature—ratchet-like teeth under the head—that not only locks into the surface and holds tighter, but also speeds assembly. It does away with extra parts and special handling. Bet your switches could use 'em, Bill."

MORAL: Look to your fasteners for an often overlooked opportunity to reduce costs, and strengthen your competitive position. New fasteners may prove more efficient

than the ones you're now using. Or you may save by the stepped-up production you get from using the finest fasteners . . . RB&W bolts, nuts, rivets and screws of uniform accuracy, dependability and physical properties.

Let RB&W help you make the most efficient use of fasteners on your assembly line. Address RB&W at Port Chester.

RB&W—The Complete Quality Line. Plants at: Port Chester, N.Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Calif. Additional sales offices at: Philadelphia, Pittsburgh, Detroit, Chicago, Dallas, San Francisco. Sales agents at: Portland, Seattle. Distributors from coast to coast.

**RUSSELL, BURDSALL & WARD
BOLT AND NUT COMPANY**

RB & W 108 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG

March 5, 1953

assumption that many Americans like the small car's ease of handling and economy, but aren't willing to give up one luxury feature to obtain it.

Crest of Pinin Farina, the Italian custom stylist, is worn by the Rambler, as it is by the entire Nash line.

New emphasis on "continental" styling lies in the rear tire mount, standard equipment in convertible and hardtop lines.

Getting Hot . . . A top sales executive at Ford dropped a challenge to Chevrolet last week that indicated the battle between these two top producers is going to be hot before the year is over.

At a press preview of the 1953 Ford truck line, L. W. Smead, general sales manager for the Ford Div., pointed out that Ford had jumped into a lead in 1953 sales.

On the basis of new registrations, Ford led in January sales in 18 of 27 states which have reported to date.

Mr. Smead claimed Ford sold 46,-

Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS	TOTAL
Feb. 28, 1953	134,774*	30,129*	164,903*
Feb. 21, 1953	133,485	27,620	118,397
Mar. 1, 1952	90,777	27,620	161,860
Feb. 23, 1952	83,707	26,835	110,542

*Estimated

Source: Ward's Reports

900 passenger cars during the month against 38,719 for Chevrolet, giving Ford 21 pct of total new car sales against 17.3 pct for Chevrolet.

Early Start . . . This may not be entirely because of strict Ford preference on the part of the public. Chevrolet did not announce its new car until well into January while Ford had the benefit of a full month's sales. During this same month, Chevrolet out-produced Ford by 100,000 to 75,000 cars in round figures.

Meanwhile, Ford production schedules are geared for another 75,000 cars in February, 90,000 in

March, and 105,000 in April, a pace Ford hopes to continue throughout the rest of the first half.

At the same time, Chevrolet is turning out cars at a rate better than 31,000 a week. February's production at Chevrolet should reach 113,000. On the basis of figures, it appears that Chevrolet will again lead the production.

LABOR:

Union turns down GM offer . . . GM makes contract "living document."

Some details of the continuing talks between General Motors and the UAW slipped into the open late last week when union negotiators disclosed they had turned down a GM offer to revise some points in the 5-year labor pact.

Current discussions have been under way since the substitution of a new cost-of-living index became a wedge with which the union hoped to reopen contracts midway through their 5-year terms.

UAW statements indicated that GM had offered to add 14¢ of cost-of-living raises to the basic hourly wage and give a 5¢ hourly wage boost to some 40,000 skilled workers. Offer to raise the basic wage level would involve no immediate cost, but would insure that the wages could sag only 11¢ at the most in case of a recession.

The union had asked the level be raised 21¢ as well as larger gains for skilled workers, increased pensions, and an increase in the annual productivity factor.

By offering to reopen some points of the ironclad 5-year contract, GM indicated its own intention to keep the pacts in the nature of "living documents" subject to revision as circumstances dictate.

THE BULL OF THE WOODS

By J. R. Williams



This Week in Washington

Has U.S. Been Hoarding Machine Tools?

Committee will hold hearings . . . Await Munitions Board inventory report . . . Rep. Shafer cites complaints of firms . . . Where some tools are . . . Tax-free retirement—By G. H. Baker.

port demand for older machine tools is not strong while late model tools remain popular.

National Production Authority operates a machine tool inventory center known as Production Equipment Central Inventory Group. Since May 12, 1952 PECIG has inventoried over 34,000 tools. The center had as of January allocated 10,477 tools and issued shipping instruction for 3197 units. Value of the 34,000 tools at today's prices would reach \$1 billion, official said.

Tax Free Retirement . . . Increasing support for bills authorizing tax-deductible retirement plans for self-employed persons continues to build on the House side of the Capitol. Senate attitude, however, is more cautious. A "wait-and-see" approach sums up the Finance Committee's current reaction.

To all self-employed persons, the two pending bills on the subject are important ones to be acted upon by the present Congress. Sponsored by Reps. Thomas A. Jenkins, R., O., and Eugene J. Keogh, D., N. Y., the bills would, in effect, permit self-employed persons to set up retirement plans with the same tax deductible privileges as approved employee pension plans now have.

What Choices Open . . . As the bills now stand, an eligible taxpayer would have the choice of purchasing a retirement annuity contract from an insurance company or putting his money into a trust fund established by a "bona fide agricultural, labor, business, industrial, or professional association or similar organizations for the exclusive benefit of its participating members."

Public hearings on the Jenkins and Keogh bills are unofficially slated to get under way within the next 60 days. Extent of interest by businessmen in the House hearings will largely determine the urgency—or lack of it—of Senate action on the measures.

Within the next few weeks a House Armed Services subcommittee will open public hearings on whether government agencies are hoarding machine tools.

Spearhead of the subcommittee's attack will be Rep. Paul Shafer, R., Mich., author of the original National Industrial Reserve Act which authorized the government to stockpile surplus machine tools 5 years ago.

Fashioning Own Noose? . . . Rep. Shafer is believed waiting for the Munitions Board inventory of surplus machine tools to prove his case. That report is to be issued on Apr. 1—by law.

When queried by THE IRON AGE as to the nature of his evidence of tool hoarding, Rep. Shafer said that almost every week brings a complaint from a firm wanting a machine tool out of government inventory and unable to get it without help.

What Mr. Shafer may find himself attacking is the tardiness of the government in releasing stockpiled tools to civilian industry—or perhaps the entire stockpiling system. Defense contractors and sub-contractors have had the welcome mat spread before them at machine tool depots. Not so civilians till defense plants had their pick.

"Isn't Any Hoarding" . . . When Mr. Shafer does get the Munitions Board inventory report he had better have some experts by his side to advise him whether or not industry wants certain machine tools in surplus—and how best to distribute tools without harming both the new machine tool and used machine tool industries.

Also queried by THE IRON AGE

was the Munitions Board which flatly denied Mr. Shafer's charging of hoarding and added that a systematic allocation of sought-after tools had been conducted in recent years. After defense contractors got their crack at reserve tools, the unwanted balance is declared surplus by Washington agencies. Then the surplus machines can be sold at auction to any bidder.

As can be expected armed services don't release a tool as surplus unless they are certain it won't fit into their production programs. IRON AGE has learned that one depot which originally had tools numbering into the many thousands now numbers its remnants in the hundreds. It is trying to get rid of them.

Where Tools Are . . . On the other hand, Federal Security Agency reports recovery of almost \$4.5 million worth of surplus tools from schools during 1952. More than 2000 tools were located. IRON AGE editors across the country re-





THIS FURNACE IS 304 HEATS OLD

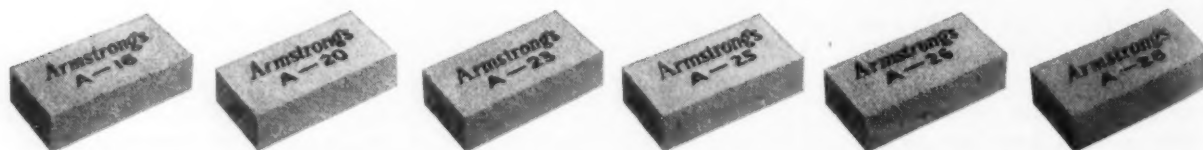
Three hundred and four heats of malleable iron castings have been put through this annealing furnace since it was built in 1941. The heats average 120 hours each, with the castings being brought up to 1780° F., then cooled to allow removal of the annealing pots by lift truck. Temperatures at the brick face approach 2000° F. After this grand total of 36,480 hours of operation, the lining of Armstrong's A-23 Insulating Fire Brick is still in excellent condition and is said to be good for many more years of economical service.

The 50-ton capacity furnace was built by the Whiting Corporation for the Columbia Malleable Castings Division of Grinnell Company, Inc., in Columbia, Pennsylvania. Armstrong's A-23 Insulating Fire Brick were chosen for the furnace lining because they have the strength required to resist spalling and mechanical abuse in this rugged kind of service. The photograph attests to the soundness of this choice. No spalling loss is to be seen anywhere, and damage

to sidewalls from bumping of annealing pots has been negligible.

Behind the lining of A-23's are 9" of A-20's, chosen because their excellent properties prevent excessive heat loss and greatly increase furnace efficiency. The condition of this furnace after 12 years of severe service points up the fact that when insulating fire brick are properly matched to the requirements of the job, they will last a long, long time.

Choosing the right brick is easy when you buy from the complete Armstrong line of six brick types for temperatures up to 2800° F. Each type is carefully formulated to give you high insulating efficiency, great strength, high spalling resistance, light weight, and all the other properties that mean long and satisfactory insulating fire brick service. For full information on these long-lasting brick, call the Armstrong office nearest you or write direct to Armstrong Cork Company, 4903 Mulberry Street, Lancaster, Pennsylvania.



ARMSTRONG'S INSULATING REFRACTORIES

COKE: Won't Reach Expansion Goal

Strike, other delays will hold coke expansion 5 million tons under year-end target . . . Building has stayed ahead of blast furnace growth . . . No shortage seen—By A. K. Rannels.

Unavoidable delays are going to cause coke production capacity to fall short of the expansion goal for Dec. 31—close to 5 million tons short as matters stand now.

Delay in the expansion program does not necessarily mean a shortage of coke, say government people, but chances of tighter supplies increase each day.

Reason is that through most of 1952, coke oven construction not only kept pace with blast furnace expansion but stayed a few steps ahead. But this spread may decrease as new pig iron capacity comes into production this year.

Strike Slowed Buildup

Failure to meet the expansion goal comes as no surprise to the Defense Solid Fuels Administration. It had become apparent last fall following the steel strike which further slowed expansion.

Since that time, the government has issued additional tax amortization certificates covering \$55 million worth of new coke facilities. But it is a long jump between issuance of a certificate and completion of new facilities.

To date, 85 tax certificates have been issued for construction of coke facilities, largely of the slot-type ovens. These cover roughly \$470 million in integrated facilities, \$135 million for nonintegrated plants, and \$2 million for beehive.

Aim at 84 Million Tons

Original goal was to increase capacity of slot-type ovens to 84 million tons by the end of 1953. This meant an expansion of 13 million net tons above 1950 capacity.

More than that, allowing for retirement and dismantling of over-age facilities, it meant that total new capacity needed would amount to close to 17 million tons.

Due to the steel strike and other factors, the net gain during 1952

is estimated at not much more than 3 million tons. If no new delays are encountered this year, the program will be something less than 5 million tons short of the goal.

This deficit is expected to be wiped out during 1954. But, says SFDA, this capacity will start slipping again unless a new construction rate is maintained at a rate of about 3 million tons a year to offset over-age losses.

Projections by the Materials Policy Commission last fall indicated that capacity could not stand still at 84 million tons. Said MPC: Coke requirements will continue to rise, even after expansion to 120 million tons of steel capacity.

It was estimated by the commission that during the next 20 years demand for coke will increase more than 50 pct above the 1950 level—meaning a needed capacity of 120 million tons in 1975.

Reaction to Barge Sale Good

Favorable industry reaction to the Eisenhower Administration's plans for "getting the government out of business" is reflected in the large number of responses from firms interested in buying the Federal Barge Lines.

Secretary of Commerce Sinclair Weeks is now preparing detailed statistical data on which the in-

terested parties (about 40 thus far) may base firm bids.

Sale of the barge lines should net the Federal Government somewhere between \$3 million and \$5 million, it is estimated. Under government operation, the lines have been consistently in the red.

Railroads have contended for years that the government's barge rates have been too low—detrimen-

mentally low to rail carriers. Two basic requirements involved in the sale of the lines are that the buyer have no connection with a railroad, and that he provide no less service than is now rendered by the government.

Renegotiation Board Exemptions

Cobalt hunts in California or searches for manganese in Maine, if aided by the government under Defense Minerals Exploration Administration contracts, are not subject to Renegotiation Board procedures, the board has ruled.

The board last week amended its regulations to exempt these exploration contracts, under which the government helps to finance surveys for unknown and undeveloped sources of short-supply metals and minerals. Such agreements provide for recovery of the federal investment if the projects prove to be financially worthwhile.

At the same time, exemption was provided for all Tennessee Valley Authority contracts except those for electric power and chemical projects.

Amendments authorizing these exemptions were issued Feb. 27.

Name Group to Study Benefits

Magnitude of the task of sorting and evaluating congressional proposals for changing the Social Security Act makes actual legislation this year unlikely. (See THE IRON AGE, Feb. 26, p. 72.)

A House Ways and Means subcommittee has been named under Rep. Carl T. Curtis, R., Neb., to study proposed bills and make recommendations. Agenda listing topics for examination is to be announced shortly.

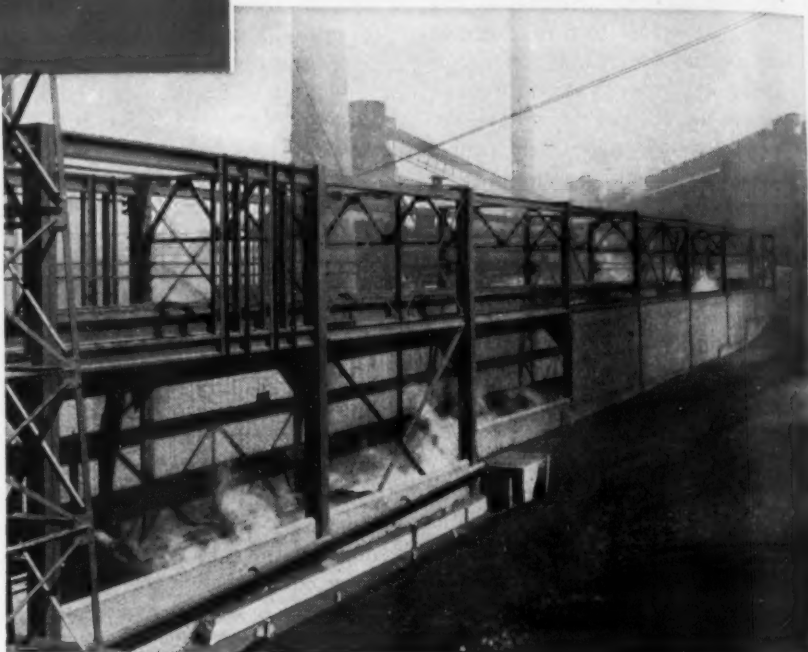


"He's made a name for himself, but I'd rather not say what it is."

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The Superior Coating

... protects metal equipment
where coke quenching fills
the air with acid vapors.



This spot is considered one of the most corrosive areas in a steel mill. That's why this crane runway is coated with INSUL-MASTIC 4010. The pit under this runway receives all the steaming, acid laden water from freshly quenched coke in a mill where the water must be used over and over. All year long gnawing vapors rise from the pit and cover the steel runway. No damage results, but look at what the vapors have done to the painted steel at the far left.

INSUL-MASTIC is the *Superior* coating that protects for a great many years. Its Gilsonite content makes it practically inert to acids. Its mica content makes it almost immune to weather. It's homogenized so that nothing settles in the drum . . . it is sprayed as it is blended. It is applied 1/16" to 1/8" thick in one coat.

All this adds up to a *Superior* coating . . . and this crane runway is only one of the many corrosive areas in steel mills where INSUL-MASTIC guards against the attacks of corrosion.

Write for the name of your nearest INSUL-MASTIC Representative for expert advice on protecting your equipment where coke quenching and other sources of corrosion take place.

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coatings that last!*

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West Coast Report

San Francisco Gets New Bridge

Work starts next week on third bay structure after years of delay . . . Judson-Pacific Murphy Co. will build the \$62-million bridge, use 70,000 tons of steel—By T. M. Rohan.

After years of haggling, work finally starts next week on the third major overhead bridge across San Francisco bay.

Judson-Pacific Murphy Co. of Emeryville, Calif., will start work on a \$62-million, 4-mile cantilever bridge. This will run east and west between heavily industrialized Richmond, 15 miles north of Oakland, and San Rafael, residential town. The bridge, which will take 3½ years to build, will replace a sorely overloaded ferry service in operation since 1915.

Not the Biggest . . . The new bridge is not in a class with the spectacular \$26-million (1937) Golden Gate, or \$77-million San Francisco-Oakland bridge. The Golden Gate, built largely by Bethlehem, required about 83,000 tons of steel and the Bay bridge (U. S. Steel) 200,000, compared to about 70,000 tons for the new bridge.

The new north bay crossing represents a spectacular victory for Judson-Pacific and will be the biggest job in its history. But it has built dozens of smaller bridges. J. Phillip Murphy, president, has been active in construction at Shasta Dam and others before acquiring interest in Judson in 1945. He also supervised tricky dismantling of the wrecked Narrows bridge at Tacoma, Wash.

Low Bid . . . On the steel superstructure work, Judson-Pacific with a bid of \$21 million was far under American Bridge Co. (U. S. Steel) at \$28 million and Bethlehem Pacific at \$30 million.

Mr. Murphy said use of western made plates, channels and angles with local fabrication will permit him to come within the limits.

About 40 pct of total tonnage will be western produced, highest tonnage of any modern bridge. Major tonnages will be 41,000 structural and 25,000 in "H" section foundation pilings.

About 500 men will be employed at peak and they will come from other jobs of Judson-Pacific and Peter Kiewit & Sons of Omaha, construction firm and co-bidder along with A. Soda and Son, also of Emeryville.

Long Delayed . . . Start of construction followed years of haggling and obstruction by earth barrier proponents, who last week were still embroiling the state legislature. Sweeping action by the State Supreme Court and Gov. Warren permitted sale of \$62 million in bonds by Blyth & Co., San Francisco and New York investment firm, to 210 bonding companies last week, opening the gate for construction.

Initial traffic on the bridge is expected to be 4 million cars annually. Originally, there will be three 12-ft lanes in each direction, but later a lower level will be con-

structed for one-way traffic on each deck.

Fast Switch . . . The San Francisco and Mare Island naval shipyards about 25 miles apart across San Francisco Bay have been rivals for years.

Last week, Mare Island chalked one up for its side. From Washington, it was announced an \$18-million amphibious tractor rehabilitation program would be transferred from San Francisco to Vallejo, confirming earlier reports from union sources. The San Francisco yard is now completing a \$30-million conversion program which included a specially built assembly and conveyor line.

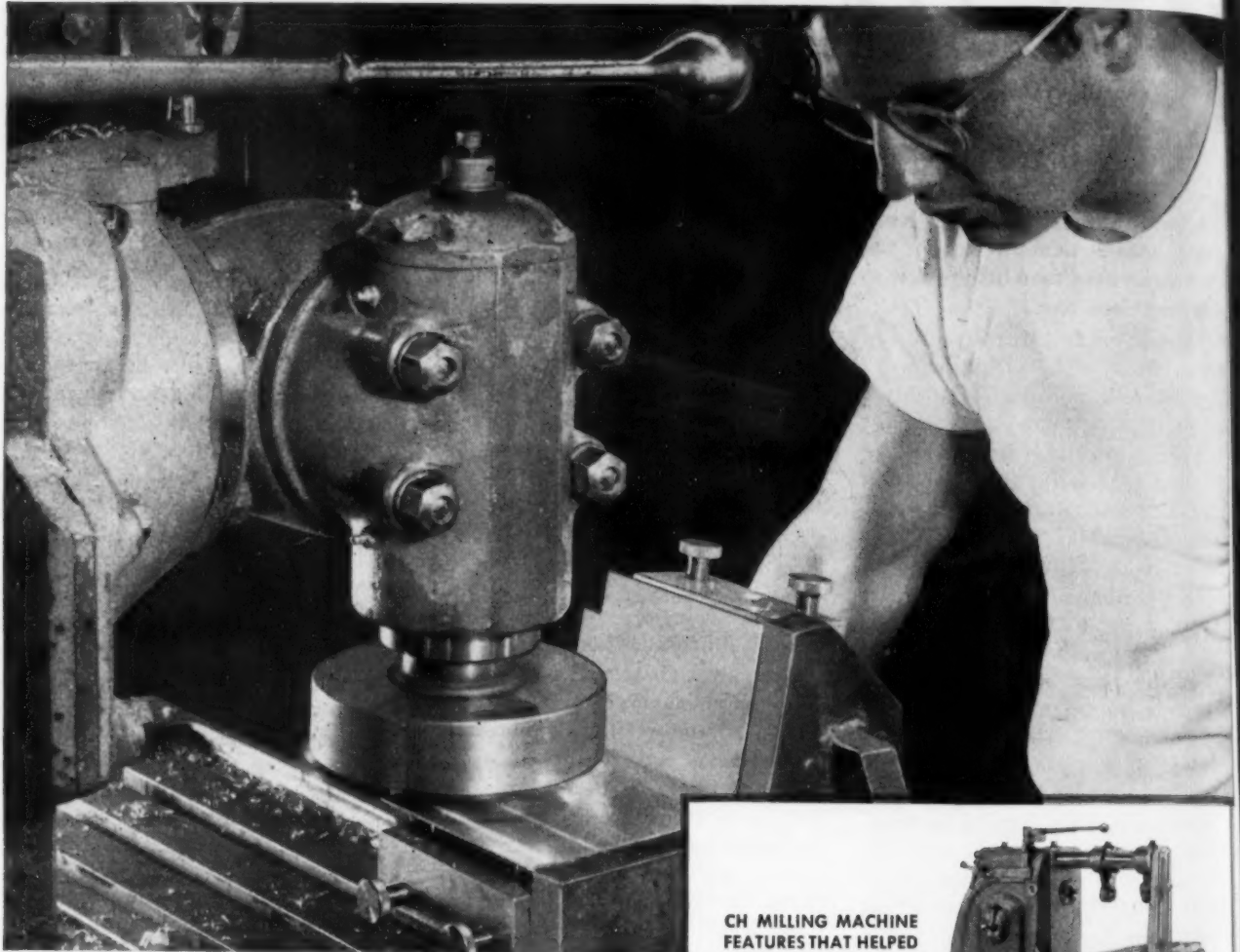
Jets Take Over . . . The last of 17,000 propeller-driven bombers in the past 10 years came off the Boeing production line at Seattle last week, signalling start of 100 pct jet bomber building. The last B-50 in a trainer version was turned over to the Air Force, leaving the giant 8-jet B-52 swept-wing heavy bomber and medium-sized B-47 Stratojet as sole Boeing production units.

The last B-50 ended a 10-year output of 17,000 Boeing designed 4-engine bombers at Seattle and under license at other plants. This included 4250 World War II Superforts, B-29s and B-50s and 12,731 earlier B-17s up to 1945 at Boeing, Douglas, Lockheed, Bell and Martin. Total B-50 production figures are restricted.

Doesn't Sell . . . The French steel industry currently is adding \$200 million per year basic and finishing capacity but excessive freight and Canal Zone costs keep it from denting the western U. S. market. P. L. Schereschewsky, secretary of the French steel industry association (Chambre Syndicate de la Siderurgie Francaise) on a Western swing last week said French exports to the western U. S. are less than 50,000 tons.



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Machine: 5 hp, No. 2, Model CH, Plain Style
used with Universal Milling Attachment.
Part: Aircraft fitting for horizontal stabilizer.
Material: 75ST aluminum alloy.
Cutter: One blade — 8" fly cutter.
Cutter Speed: 875 rpm, 9 ipm feed.
Depth of Cut:050".
Production: 12 pieces per hour — all sides milled.

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life and accuracy.



Greater cutting efficiency
— design refinements in
3-bearing spindle and a
train of heavy duty, wide-
faced, forged steel gears,
hardened and specially
processed.

Speed range—16 speed changes
are provided from 25 to 1500
rpm. **Extra-wide feed range—**
16 changes from 1/4" to 32" per
minute meet requirements of
new metals and cutting tools.



Machine Tool High Spots

M-41 Easing Hypos Civilian Market

Amendment permits builders to book civilian orders for Exhibit D machine tools . . . Should jack up backlogs, increase production . . . New orders still climbing—By E. C. Beaudet.

Further stimulus was added to the civilian market for machine tools as the National Production Authority this week permitted builders of machine tools on the critical list to accept nonrated orders. The amendment to M-41 became effective Mar. 1.

Donald M. Pattison, director of XPA's Metalworking Equipment Div., said the move was made because military production lines are now getting "timely" deliveries of machine tools.

Another reason given for further relaxation of M-41 is that it will provide fuller and better planned production of these vital machine tools.

Orders Drop . . . Builders of Exhibit D machines were facing a continuing decline of military orders. As a result backlogs dropped and production rates were threatened.

The effect of permitting civilians to place orders will be beefed up backlogs and higher production rates. It will also permit builders to fill holes in present production schedules and help out civilians in desperate need.

Have Met Needs . . . This latest step toward full decontrol of the industry is another indication of the progress that has been made in filling the needs of partial mobilization. Since last July service backlogs of machine tools have been dropping at the rate of two weeks per month.

Backlogs of military orders have fallen at a very rapid rate. In July, 1952, service orders for all types of machines totaled 47,500. At present this figure is around 30,000.

By the start of the third quarter of this year orders are expected to have fallen to around 17,000, if the present rate of decline is not stemmed.

Further Cuts? . . . Awareness of this situation has resulted in the gradual relaxation of industry controls. While civilian orders have increased since partial decontrol started, the possibility of further production cutbacks by individual machine tool builders suffering from a loss of orders is expected to result in additional relaxation of machine tool restrictions.

The economic soundness of decontrol is apparent. Since last August, when builders of non-critical machines were permitted to book nonrated orders, backlogs for machine tools not carrying any kind of rating have risen from \$110 million to a February total of \$225 million.



More for Civilians . . . It is hoped that the new amendment to M-41 will allow the builders of machine tools on the critical list to achieve the same economic benefits. Under the new amendment these builders will not have to use more than 70 pct of their production to fill military orders. The remaining 30 pct can be distributed among rated defense users and nonrated civilian users.

Backlogs of items appearing on the critical list, however, are still high for many companies. And it is not expected that many civilian orders for these items will be taken for several months to come.

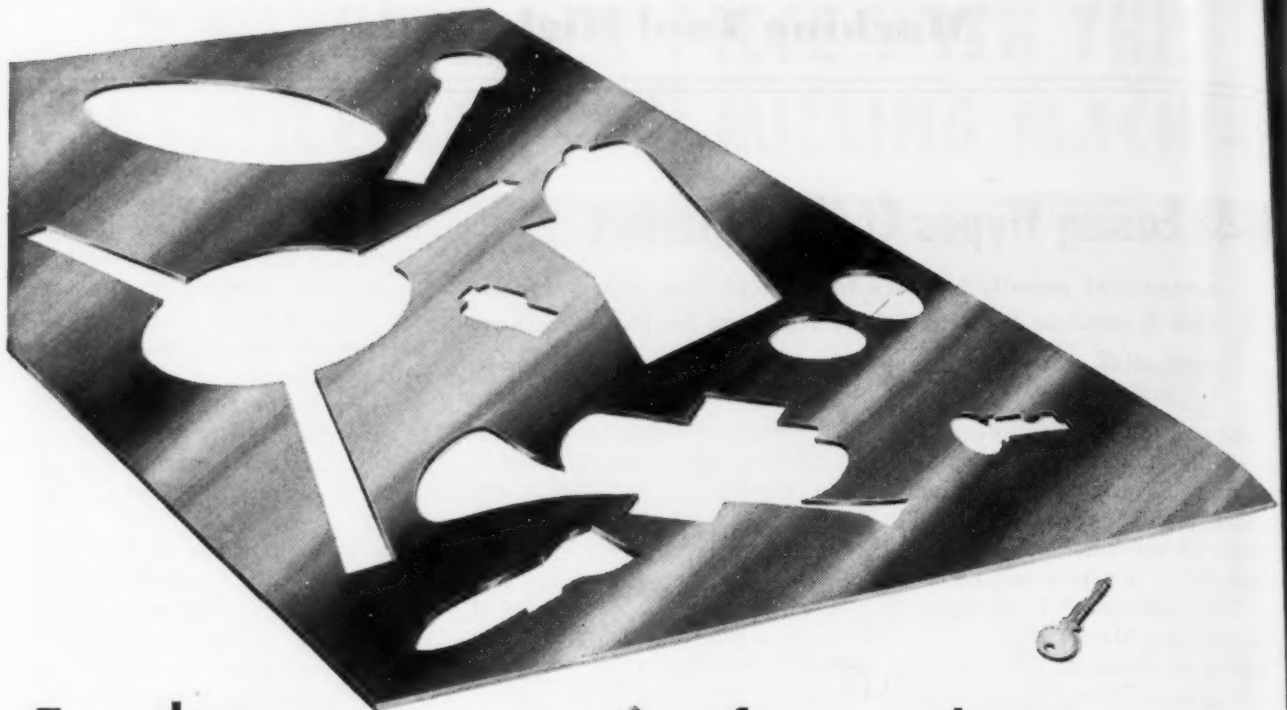
Military Takes Half . . . Service orders now represent about 50 pct of all machine tools on overall industry backlogs as compared with 54.9 pct last October.

Builders hurt competitively by critical list restrictions will now be able to regain those customers who were lured away by competitors not booking many military orders. It will also give greater confidence to builders wishing to expand their plants.

New Orders Mount . . . Along with the steps toward decontrol of the machine tool industry has come an increase in purchases from domestic consumers. For the second straight month new orders for machine tools have been on the upgrade.

Figures released by the National Machine Tool Builders' Assn. show the new order index at 254.9 for January, as compared with 225.2 for December. This represents about \$75 million worth of new business for January and about \$66.5 million for December.

Shipments continued at a high rate of 361.9, an increase over December's 355.0. Overall industry backlogs are still hovering around the 9-month mark. Most of the increased sales have resulted from civilian buying spurred by relaxation of controls.



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You'll cut production costs on polishing and finishing by using Chase Brass or Copper Sheet. Chase Sheet is free from oxide coating, uniform in color and the surfaces are smooth.

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An X-Ray gauge controls the thickness of Chase brass sheet as it passes through the rolls.



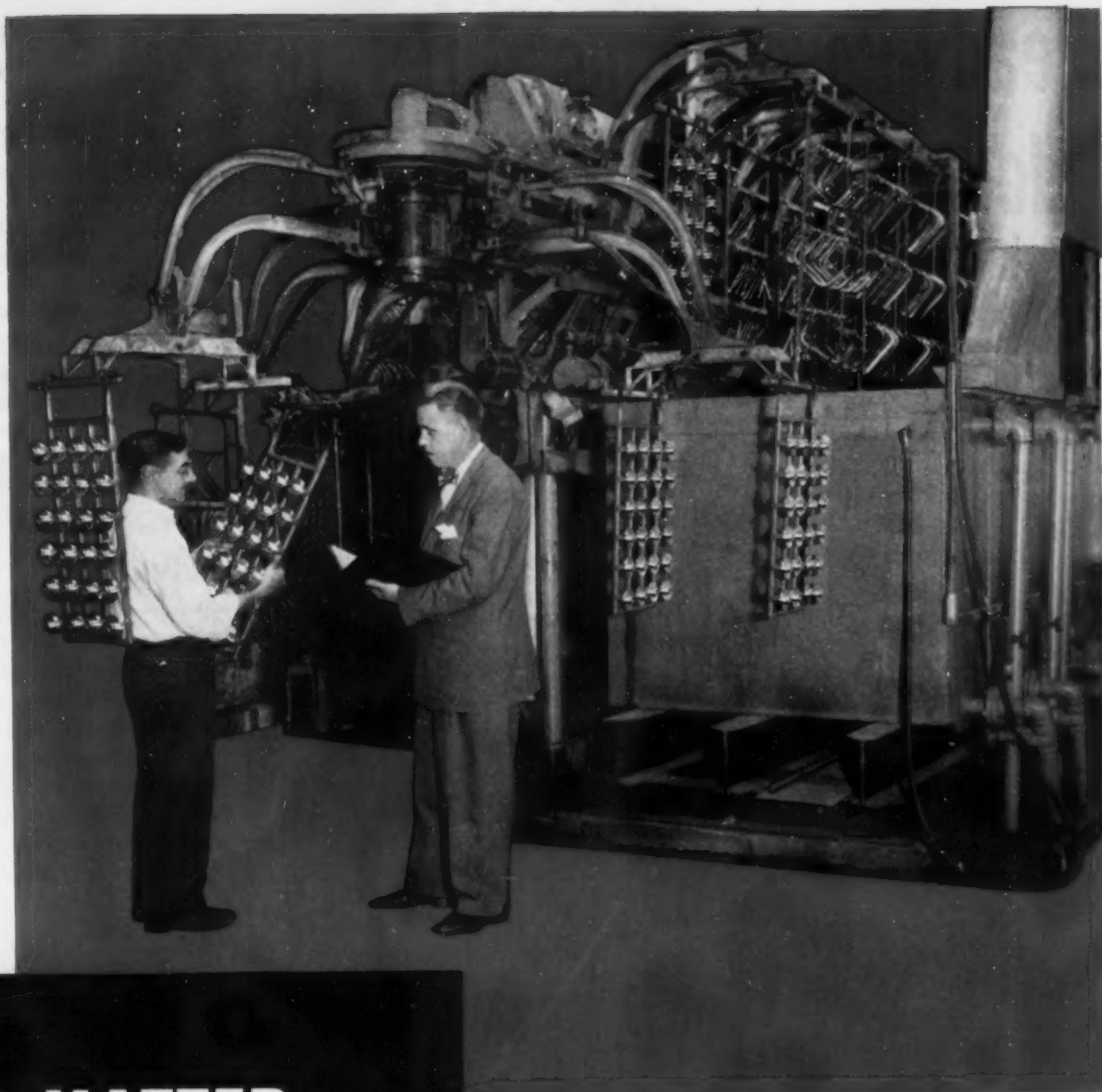
Quality-control inspectors check on the metal at key operations from start to finish.

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Stevens Model "A" Automatic Plating Machine

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That's the report of the New England Plating Co., Worcester, Massachusetts. At present, New England Plating has 2 Stevens machines in operation. With this equipment, they do nickel plating and dichromating automatically—quickly—economically!

These Stevens Automatic Plating machines have launched the New England Plating Company on an entirely new phase of the company's history. They are contemplating the installation of still a third Frederic B. Stevens machine in the near future.

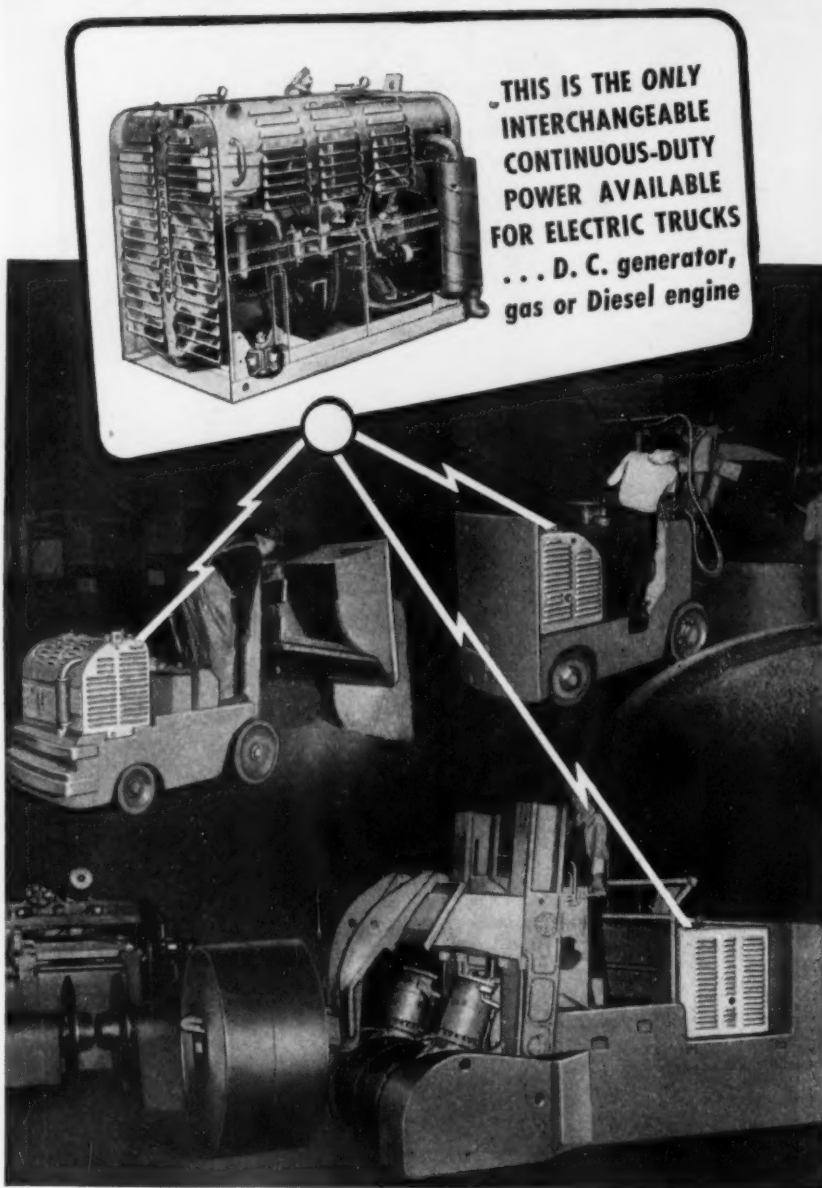
Let us help you with your plating problems. Call a Stevens technical representative — there's one in principal cities — or write direct. FREDERIC B. STEVENS, INC., DETROIT 16, MICH.



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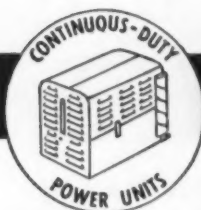
March 5, 1953

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Free Publications

Continued

Noise control

Reynolds Acoustical System, outlined in a new circular, provides uniformly high noise reduction at all frequencies. The system consists of corrugated and perforated aluminum panels above which is placed a sound absorbing blanket. The sound absorbing material is laid directly on the panel or may be attached to the ceiling structure above. More information is in a new leaflet. *Reynolds Metals Co.* For free copy circle No. 15 on postcard, p. 146.

Pulverizing

Pulverization of solid materials such as limestone, coal, coke, mica, perlite, feldspar and graphite is discussed in a new bulletin on the Majac Jet Pulverizer. Detailed information and technical data on the engineering, assembly and operation of these units are included. *Majac Engineering Co.* For free copy circle No. 16 on postcard, p. 146.

Airtubes

Lamson Corp. has issued a colorful 50-p. booklet titled, *On Target*. The publication illustrates and describes many uses of Lamson Airtube systems in industry and commercial enterprises. It shows how the handling of paperwork is greatly speeded and simplified by the installation of an airtube system. *Lamson Corp.* For free copy circle No. 17 on postcard, p. 146.

Fuses

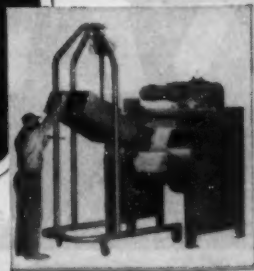
A complete catalog of General Electric fuses has recently been issued. Covered are renewable time-delay fuses, one-time fuses, plug fuses, fuse holders and copper link fuses. There is also a technical data section. *General Electric Co.*

For free copy circle No. 18 on postcard, p. 146.

Ball bearings

Listed in a new catalog put out by Nice Ball Bearing Co. are standard radial, thrust and combined radial-thrust bearings of both precision and unground types. Many special bearings and other anti-friction products are included. *Nice Ball Bearing Co.*

For free copy circle No. 19 on postcard, p. 146.



The Greatest Finishing Story Ever Told!

NAME <i>Leading Automobile Mfr.</i>			SHIPMENTS	
DATE	MODEL NO.	SERIAL	Initial Order 1 Unit—Re-ordered 27 units since original purchase	
8/18/48	DB-2	1234		
NAME <i>Large Gear & Ball Bearing Mfr.</i>			SHIPMENTS	
DATE	MODEL NO.	SERIAL	Initial Order 1 Unit—Re-ordered 25 units since original purchase	
6/1/48	DB-2	1040		
NAME <i>Leading Business Machine Mfr.</i>			SHIPMENTS	
DATE	MODEL NO.	SERIAL	Initial Order 1 Unit—Re-ordered 32 units since original purchase	
8/30/52	DB-200	445		
NAME <i>Leading Appliance, Radio & T. V. Mfr.</i>			SHIPMENTS	
DATE	MODEL NO.	SERIAL	Initial Order 1 Unit—Re-ordered 36 units since original purchase	
7/28/51	DB-8	1096		
NAME <i>Large Chain & Sprocket Mfr.</i>			SHIPMENTS	
DATE	MODEL NO.	SERIAL	Initial Order 2 Units—Re-ordered 24 units since original purchase	
7/28/51	DB-400	269		
7/28/51	DB-400	260		
NAME <i>Leading Appliances & Electrical Equip. Mfr.</i>			SHIPMENTS	
DATE	MODEL NO.	SERIAL	Initial Order 4 Units—Re-ordered 74 units since original purchase	
8/1/48	DB-2	1172		
8/1/48	DB-2	1173		
8/1/48	DB-2	1174		
8/1/48	DB-2	1175		

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Please send Free Booklet "Advanced Barrel Finishing" equipment catalog, and details about your Free Sample Processing and Free Engineering Service.

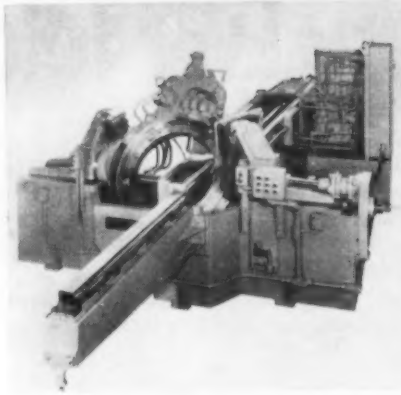
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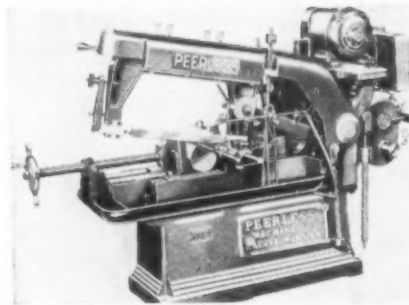


Trunnion fixture broaches jet engine segments

A standard 10-ton, 90-in. stroke horizontal broaching machine incorporates a special trunnion fixture for broaching internal angular slots in jet engine segments of various diameters. Allowable angular adjustment is from 15° to 45°. An internally mounted rotor in the fixture is actuated by an index mechanism mounted at the top, allowing the workpiece to be advanced in accurate increments. Indexing is pow-

ered hydraulically through change gears and a Geneva motion, controlled by limit switches and locked in place by a positive plunger. Selective electrical circuits provide for fully automatic operation, single indexing, or independent inching motions for all hydraulic units, both forward and reverse. Forced feed supplies lubricant at each ram pass. *Colonial Broach Co.*

For more data circle No. 20 on postcard, p. 143.

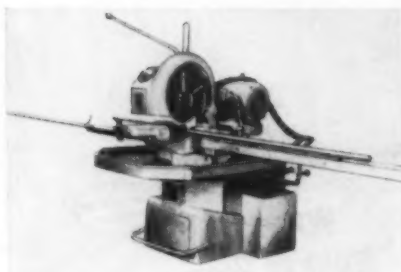


Metal cutting saw is rugged and accurate

A new standard 10x10 in. metal cutting saw is an overarm type with an open saw frame to permit loading from front or side for the general purpose work it is designed to handle. Heavy overarm carries and guides the saw frame, giving it best possible control for a saw of this type. A heavy U-type saw

frame has wider shoulders, assuring true alignment and consequently more accuracy. The widened bearing shoulders add rigid control of the saw blade, effecting accuracy throughout the entire cut. Vise clamps work from 90° to 45°. *Peerless Machine Co.*

For more data circle No. 21 on postcard, p. 143.

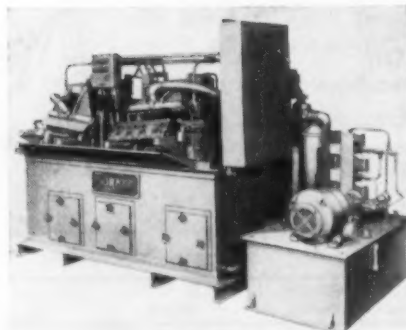


New features improve cutoff machine performance

Design and construction changes in a new line of Ballinger cutoff machines have increased abrasive wheel life, provided greater cutting accuracy and eliminated burr and fraze, especially from thin walled material. These machines cut the hardest materials known. Coolant is

supplied to each half of a housing guard. Rotation of the wheel builds up a water pressure between the faces of the wheel and the guard for efficient cooling, minimum blade oscillation and greater cutting accuracy. *Douglas Export-Import Corp.*

For more data circle No. 22 on postcard, p. 143.



Flush-out machine washes cylinder heads

A multiple cylinder head flush-out machine for testing and washing sand and chips from semi-machined cylinder heads was engineered for greater speed and efficiency of the flush-out process. The cylinder head is placed in one side of the machine, tripping limit switches. When operator presses buttons, fixture closes, and water pressure is

automatically applied to fixture and forced into all unsealed openings in the cylinder head. Relatively high speed is achieved since the operator is able to load and unload other fixtures onto the machine during the sequence of operation. *Turner Bros., Inc.*

For more data circle No. 23 on postcard, p. 143.

Turn Page



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The main job of the Hansen representative is to supply you with exactly the right couplings for your particular requirements—where quick connection and disconnection will save you time and money.

There are, however, hundreds of plants that regularly make use of his experience to improve the overall performance of their fluid line circuits. Frequently when trouble arises, he can make suggestions which will effectively correct your difficulties.

From years of experience in close contact with many types of hook-ups, both large and small, he can advise you on how to make pipe connections for proper take-off, how much and in what direction to pitch your lines, and where and how to install drains—all designed to give you more efficient, trouble-free performance of your air-operated devices.

QUICK-CONNECTIVE FLUID LINE COUPLINGS

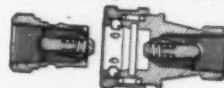
1. QUICK
CONNECTION AND
DISCONNECTION

2. INSTANT
AUTOMATIC FLOW
OR SHUT-OFF

One-Way Shut-Off



Two-Way Shut-Off



ALSO STRAIGHT-THROUGH QUICK-CONNECTIVE COUPLINGS
Send for Catalog!

THE HANSEN



MANUFACTURING COMPANY

4031 WEST 150th STREET

CLEVELAND 11, OHIO

New Equipment

Continued



Indicates magnitude and location of unbalance

Instead of picking up vibration of a rotating piece and then calculating unbalance through intricate electrical networks, the Trebel Dynamic Balancing Machine introduces a counter motion into the bearings in which the piece rotates until a perfectly smooth running condition is

obtained. This takes only a few seconds. At this point, the machine indicates the magnitude and location in oz-in. to an accuracy within 0.000025 in. displacement of center of gravity. Unskilled operators can be trained quickly to operate the machine. *Kurt Orban Co., Inc.*

For more data circle No. 24 on postcard, p. 143.

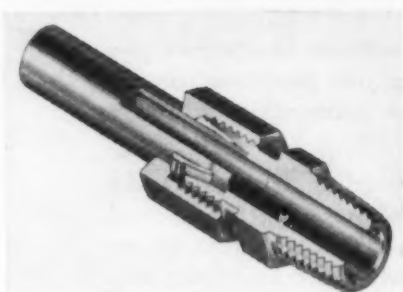


Cylinder blocks finished at 71 pieces per hour

Operations on a new Transfermatic for machining tractor cylinder blocks include drilling, counterboring and tapping the recess for oil filter; drilling, counterboring and reaming two Welsh plug holes; milling, drilling, reaming and tapping the hydraulic pump mounting pad; milling, chamfering and tap-

ping all miscellaneous holes on both sides. The machine has 13 stations. A hydraulic power operated transfer mechanism moves the work from station to station. Automatic devices include chip conveyor; air-oil tap lubricating and cleansing with each cycle. *Cros Co.*

For more data circle No. 25 on postcard, p. 143.



Tube-fitting incorporates leakproof features

Tube fittings which provide a more positive seal than other types of fittings require no flaring, threading, welding or soldering. Special preparations and tools are not required for installation. The fitting consists of a sleeve, nut and tapered body. When the nut is tightened, it

forces the sleeve into the taper of the body. The leading edge of the sleeve contracts, forcing the cutting edge to form a slight groove in the surface of the tube. The nut pressing on the bevel of the sleeve results in a tight, positive grip. Joint is leakproof. *Weatherhead Co.*

For more data circle No. 26 on postcard, p. 143.

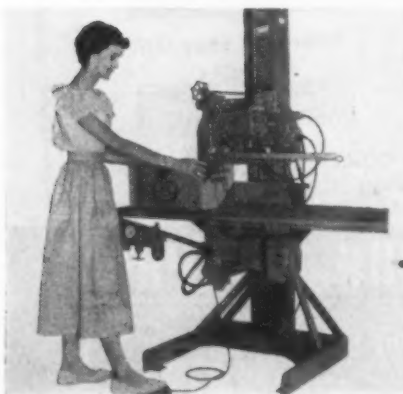


Chuck has stronger grip for heavy machining

An air-operated diaphragm chuck uses a simple, compact booster mechanism within the self-contained air cylinder. This feature gives wider adaptability and improves the performance of the chuck in many ways. The actuating mechanism develops a thrust many times greater than a conventional air cylinder. Increased power permits use of a stiffer, heavier diaphragm

which assures a higher torque factor and repeats to extreme accuracy under production conditions. The heavier diaphragm also makes possible a smaller chuck diameter and less overhang with greater compactness and less weight. Jaws open fully on each cycle regardless of fluctuating line pressure. *Sheffer Collet Co.*

For more data circle No. 27 on postcard, p. 143.



Stapling machine closes 350 cartons per hour

The Staple King, a retractable anvil stapling machine, is designed for simultaneous closing of tops and bottoms of center slotted cartons and partial or full overlap cartons, either corrugated or fiber. The retractable anvil feature permits closure from the outside, after cartons are filled with merchandise, products or materials. Air-operated, the machine is semi-automatic, and stapling heads function

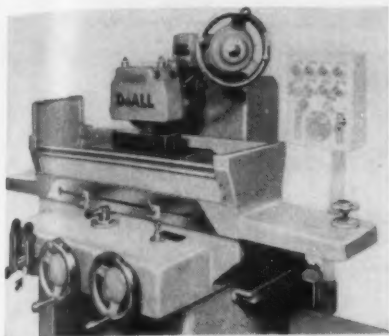
when operator touches a foot pedal. A carton guide assists in positioning cartons for stapling; a roller table guides cartons toward stapling heads. The machine automatically accommodates cartons that vary in height up to 5½ in. Warning lights automatically flash when staple supply is low. *International Staple & Machine Co.*

For more data circle No. 28 on postcard, p. 143.

Turn to Page 153

New Equipment

Continued



Precision grinder

A tool room surface grinder has handwheel slip rings which permit the handwheel to be zeroed after an initial cut and measurement check so that a direct reading of calibrations is obtained. Use of mathematics is not necessary. Another innovation is the coolant system which affords the use of finger tip control in selecting one of three coolant methods. The grinder is also equipped with a variable crossfeed drive for use in wheel dressing, broach sharpening, slotting and other applications. *DoALL Co.*

For more data circle No. 29 on postcard, p. 143.

Paint series

A new series of finishes, known as Super Roxite, has been developed for use over Endurion, a rust inhibitor for metal surfaces. These finishes provide the user with a variety of colors, degrees of gloss and drying times. They are applied equally well by brush, dip or spray methods. Surface bond is excellent and appearance is very smooth. The Endurion treatment under the paint finish effectively prevents spread of rust. *Norfolk Paint & Varnish Co.*

For more data circle No. 30 on postcard, p. 143.

Open-mesh sandcloth

Gritcloth, a new sanding cloth, is a tough open-mesh fabric that holds the abrasive firmly, but lets removed stock pass through the holes. Either side of Gritcloth may be used wet or dry, flat or folded, on sanding machines or by hand. It is easily cleaned by rinsing in water. It is available in finer grits and is suitable for smoothing surfaces on wood or metal. *Bay State Abrasive Products Co.*

For more data circle No. 31 on postcard, p. 143.

Foundry package

A four-in-one foundry package of all synthetic materials required for shell molding process and for traditional sand casting is available. Included in the package are two materials essential to shell molding: S-1054, a phenolic resin binder, and Sm-55 silicone parting agent to release shell molds from their metal patterns. These together with GE 12353 liquid core-binder resin and GE 3255 Permafil for impregnating porous castings, enable foundries to obtain all necessary synthetics from a single supplier and to receive application assistance. *General Electric Co.*

For more data circle No. 32 on postcard, p. 143.

Superheating torches

Two new jet superheating torches are fabricated of seamless steel tubing and built for rugged service. One of these is a lightweight model weighing 3 lb and operates from any standard propane tank at tank pressure. Fuel consumption is 15 lb per hr, producing 391,995 Btu per hr. A heavy-duty model weighs 5¼ lb, consumes 23 lb of propane or butane per hr and produces over 600,000 Btu per hr. *Weldit, Inc.*

For more data circle No. 33 on postcard, p. 143.

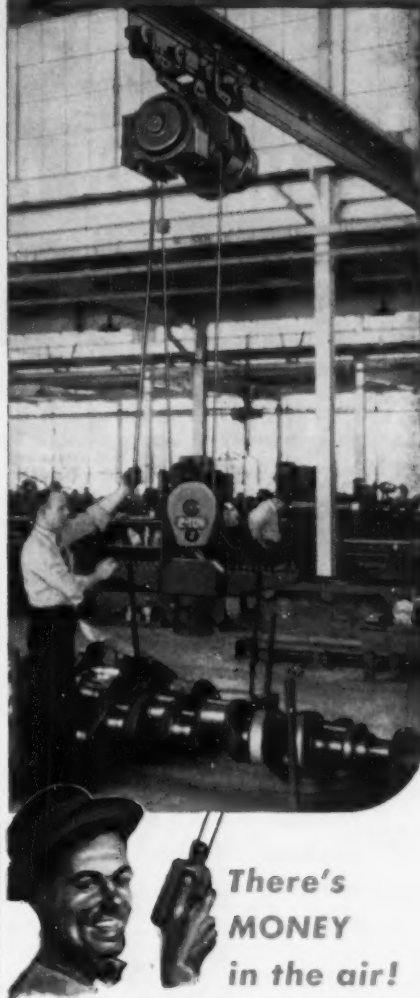


Rotary dividing table

The thinnest rotary dividing table, by Hayes of England, gives more capacity under the tool on all milling, drilling, and jig boring machines. Eleven and 12-in. diam tables are available. All castings used are heat-treated and seasoned, so the inherent built-in accuracy will be sustained under varying conditions. *British Industries Corp.*

For more data circle No. 34 on postcard, p. 143.
Turn Page

P&H ELECTRIC HOISTS



**There's
MONEY
in the air!**

In the average plant, materials handling accounts for 20% of the total cost of the product. How about your operation? Are skilled workers wasting your time and money being load-lifters? There's a better way —

**Handle it "thru-the-air"
FASTER — FOR LESS!**

P&H can help you cut costs, with swift, safe movement of loads above floor congestion. There's a P&H Electric Hoist to suit your needs exactly; the Zip-Lift for loads up to 1 ton—the Hevi-Lift for loads up to 15 tons—available with hook, jib or trolley mounting. A P&H representative can show you where and how to save money.

Call your P&H Dealer

**P&H ELECTRIC
HOIST DIVISION**

**HARNISCHFEGER
CORPORATION**

MILWAUKEE 46, WISCONSIN

SOLVE MANPOWER PROBLEMS with a SHEPARD NILES Electric Hoist



● One man replaces many—and moves more goods faster—with a Shepard Niles Electric Hoist! These rugged hoists free floor space for production, put waste ceiling area to work. They enable an older man, woman or youth to handle heaviest loads with ease.

Learn how a Shepard Niles Hoist—in light, medium or heavy capacity—fits into your production picture. Call in the Shepard Niles representative—he'll help you select the right capacity and controls for your handling job.

2 FAMOUS HOISTS

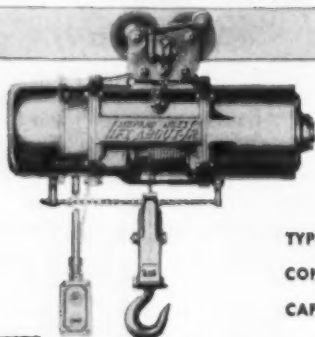
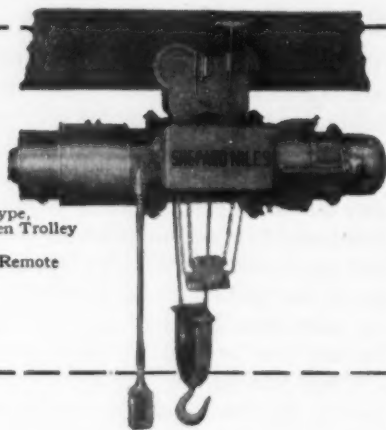
Heavy Duty SHEPARD NILES Hoist

TYPES: Lug Suspension, Hook Suspension, Base Type, Push Trolley, Geared Trolley, Motor-driven Trolley

CONTROLS: Pendant Rope, Push Button, Outrig, Remote

CAPACITIES: 500 to 40,000 lbs.

SPEEDS: To meet your requirements—Write for latest bulletins.



Light Service, Low-Cost *LIFT ABOUT-JR.*

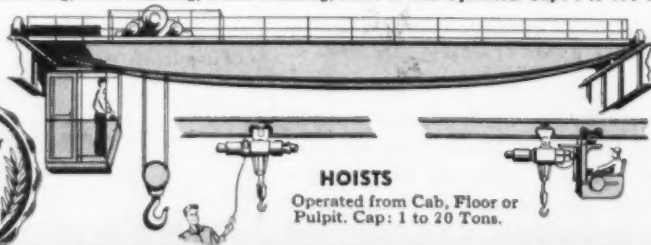
TYPES: Lug Suspension; Hook Suspension; Push Trolley

CONTROLS: Single Speed; Push Button; Rope Operated

CAPACITIES: 500, 1,000 or 2,000 lbs.
Write for latest bulletins.

CRANES

Overhead: Top Running, Inner Running, Under Running, Floor or Cab Operated. Cap: 1 to 450 Tons.



HOISTS

Operated from Cab, Floor or Pulpit. Cap: 1 to 20 Tons.

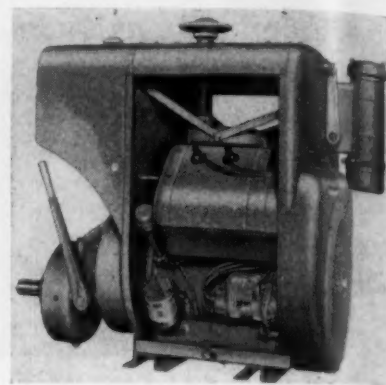
SHEPARD NILES

CRANE AND HOIST CORPORATION

1426 SCHUYLER AVENUE, MONTGOMERY FALLS, N.Y.

New Equipment

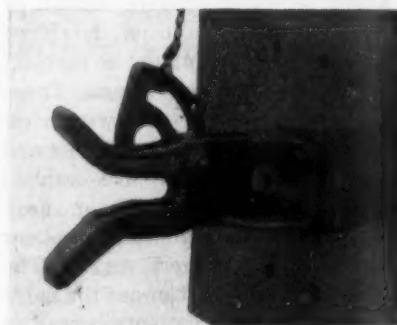
Continued



Heavy-duty engine

Developing up to 36 hp at 2200 rpm, this 4-cycle, V-type, 4-cylinder engine provides the extra margin of power needed for operating equipment in the 25 to 36 hp range. Its light weight and compactness simplifies installation where weight and space limitations are important factors. Some of its features include tapered roller main bearings, dynamically balanced forged crankshaft, mirror finish on crank pins, Stellite-faced exhaust valves and honed cylinders. *Wisconsin Motor Corp.*

For more data circle No. 35 on postcard, p. 143.



Automatic coupler

Three types of couplers for lift trucks and tractors speed pickup and release of trailers used with Towmotor units. Each type has an open jaw which connects automatically when entered by a trailer coupler. One has a hand-operated release lever, another uses a foot lever and the third permits operation either manually or by foot operation. Two of the couplers are spring-actuated and the other uses a ball-type lock. *Towmotor Corp.*

For more data circle No. 36 on postcard, p. 143.

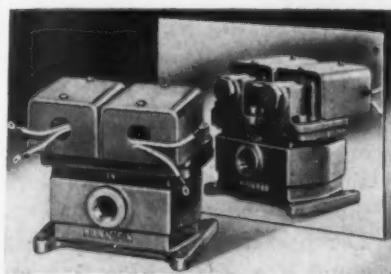
Soldering machine

Soldering of 2 to 30 or more terminals on AN connectors can be done with a new 250 w machine. It can also be used on terminal boards, printed circuits with high-temperature solder and on solder-crimped lugs. The operator merely sets the heat and the solder, brings the work to the electrodes and presses the foot switch. Electrodes reach into areas where a conventional soldering iron cannot reach. The operation requires considerably less time. *Joyal Products, Inc.*

For more data circle No. 37 on postcard, p. 143.

Air control valves

Repeats due to valve failure on mechanical presses controlled by air-operated clutches and brakes are said to be practically impossible by the use of a new, special air control valve. It is a dual 3-way valve: two 3-way valves in parallel in one



compact, common body. Both valves must operate to start the press, but if for any reason only one valve reverses, the unit "fails safe" and the press stops. Called the P-M Series BB-5, it is offered only in $\frac{3}{4}$ in. ips, capable of speeds in excess of 600 cycles-per-min. *Hannifin Corp.*

For more data circle No. 38 on postcard, p. 143.

Safety drill guide

The Sheldon safety drill guide is designed for accurate and fast drilling with the added safety factor of protecting template and work from damage due to improper or careless drilling. It permits the worker to locate the drill perfectly in the template hole before the drill tip can make any contact. The drill cannot penetrate work until the control shoulder comes in contact with template face. *Bell Electric Co.*

For more data circle No. 39 on postcard, p. 143.
Turn Page

the A-B-C of M-S-T



Michigan Electric Resistance WELDED STEEL TUBING

A
Quality
Product

A Gasoline Tank Filler Tube

ROUND

$\frac{3}{8}$ " to 4" O. D. 9 to 22 gauge

SQUARE-RECTANGULAR

$\frac{1}{2}$ " to 2" 20 gauge, 1" to 2 $\frac{3}{4}$ ",
14, 16, 18 gauge

Carbon 1010 to 1025

Michigan Tubing

has uniform strength, weight, ductility, I. D. and O. D., wall thickness, machinability, and weldability. It can be flanged, expanded, tapered, swaged, beaded, upset, flattened, forged, spun closed, fluted, and rolled. Available in a wide range of sizes, shapes and wall thicknesses, prefabricated by Michigan or formed and machined in your own plant.

For automobiles is just another of hundreds of difficult tubing fabrications manufactured in large quantities and at low cost by Michigan for its customers.

The overflow pipe is brazed to the filler tube at two points and the fastener clamps projection welded to the tube. The cam is spot welded to the tube mouth.

If you have not yet examined the possible adaptability of welded steel tubing to your product, Michigan engineers will be glad to discuss with you the many advantages of design simplification, production savings and product improvement made possible by the use of Michigan tubing.



Consult us for engineering and technical help in the selection of tubing best suited to your needs.

Plus Fabricating of our own tubing Michigan is interested ONLY IN THE FABRICATION OF Stainless steel, copper, brass and aluminum tubing.



More than 35 Years in the Business

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FACTORIES: DETROIT, MICHIGAN—SHELBY, OHIO

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*It's welded...
but you can't feel the weld*

• A special tool removes any exterior weld flash from electric-welded steel tubing immediately after welding... thus the *eye-appeal* of products like tubular steel furniture. If required, the inside can be similarly finished, meeting the *functional* requirements of products like pneumatic tube systems.

Investigate the economy and physical advantages of Brainard welded steel tubing for your products. Write Brainard Steel Division, Dept. O-3, Griswold Street, Warren, Ohio. An integrated producer; offices throughout the U. S.

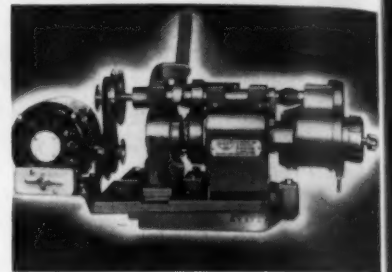


WELDED STEEL TUBING

New Equipment *Continued*

Grinding attachment

A motor-driven circularity grinding attachment simultaneously revolves the work to be ground and moves it longitudinally back and forth. This operation is the result of a direct

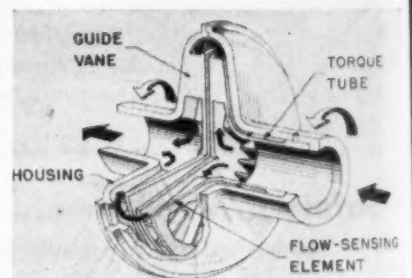


gear drive from a drive shaft to a collet housing gear and spacer gear. Simple, speedy setups permit fast and easy grinding of form relief, radial relief, form and radial relief together, tapered cylindrical and straight cylindrical. *Detroit Reamer & Tool Co.*

For more data circle No. 40 on postcard, p. 143.

Mass rate flowmeter

An instrument capable of measuring the true mass rate of flow of anything that will flow or fall through a pipe has been announced. The mass meter responds to pounds and is totally insensitive to volume. Direct reading measurements in terms of pounds per minute, or with integration, pounds, can be made on gases, liquids, slurries, or

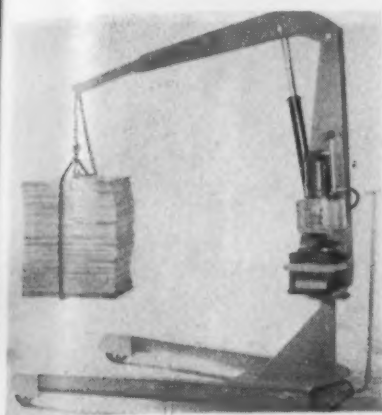


particles in an air stream, with the same instrument. Accuracy is independent of volume, temperature, pressure, viscosity, compressibility, or external accelerations. For industrial use, two or more units can be used with a proportioning unit to control perfectly any mixture in an industrial process. *Control Engineering Corp.*

For more data circle No. 41 on postcard, p. 143.
Turn to Page 159

New Equipment

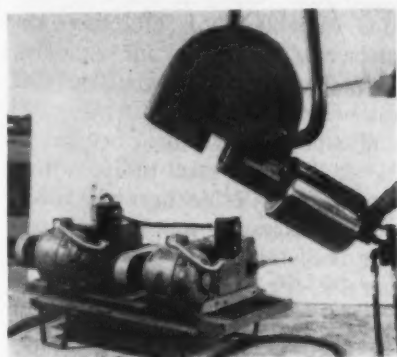
Continued



Truck-shop crane

An optional attachment for electrical operation the Hydro-Lift combination crane is a power unit that makes operation of the lift three times faster than hand operation. By moving the handle forward the power unit raises any load up to 2000 lb without any effort by the operator. Hydro-lift crane is mounted on three-wheeled base for quick, easy portability to any place in the shop. *Star Machine & Tool Co.*

For more data circle No. 42 on postcard, p. 143.



Mobile bar cutter

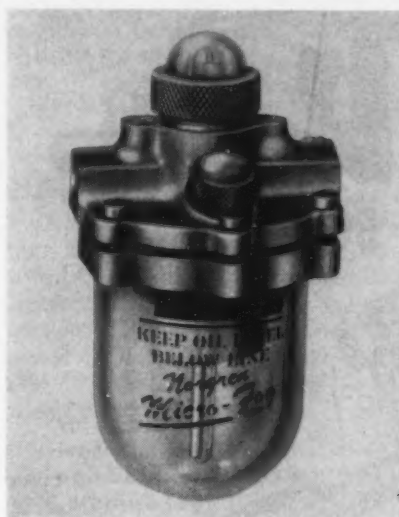
A suspension-type cutter combines tremendous thrust with easy portability. It can cut up to 2 3/4-in. diam steel rod in 13 sec. It is also adaptable for riveting cold rivets up to 1 in. and for punching and pressing. An easy-action hand-lever control eliminates the use of solenoids. Two electric hydraulic pumps mounted in tandem provide the 150-ton thrust. The unit can swivel 360° and the cutting head weighs 470 lb. *Manco Mfg. Co.*

For more data circle No. 43 on postcard, p. 143.

Plating barrel

New submerged barrel plating equipment completely immerses the plating barrel in the electrolyte. All surfaces of the work receive a uniform solution bath because no part of it can be exposed to the air while tumbling. This results in a consistent, all-over even finish. The equipment includes both barrel and plating tank. The barrel is hexagonal, has 14-in. ID. Lengths are 30 and 36 in.; capacities, 125 and 150 lb respectively. Tanks are constructed of 1/4 in. double electric-welded steel. *Hanson-Van Winkle-Munning Co.*

For more data circle No. 44 on postcard, p. 143.



Micro-fog lubricator

Bearings, spindles, gear boxes and small air-powered devices are lubricated by a Micro-Fog lubricator which produces an extremely fine and uniform oil fog at low air flow. It features a constant oil level for uniform rate of oil feed. 360° visibility of oil flow, accurate metering of oil delivery into the airline to as little as one drop in 20 min, universal right to left or left to right flow without adjustment. It is for 1/4-in. airlines and is rated for air requirements from 0.8 cfm at 10 psi to 6 cfm at 80 psi. Maximum safe operating pressure is 150 psi and maximum safe temperature is 120°F. *C. A. Norgren Co.*

For more data circle No. 45 on postcard, p. 143.

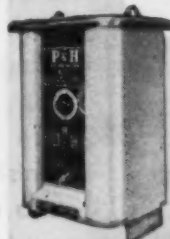
Turn Page

P & H

WELDING HEADQUARTERS

—that's where you find cost-cutting answers to welding problems

P&H AC WELDER

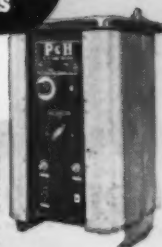


Any heat at your fingertips — right at the work — with Dial-electric Instantaneous Remote Control. Sizes up to 625 amps., NEMA rated. Connectable to 220 and 440 volts.

P&H WELDING TWINS

P&H DC RECTIFIER WELDER

Right now — at the work — fingertip Dial-electric Control gives you the heat you need. Three sizes, 200, 300, and 300 amps., NEMA rated.

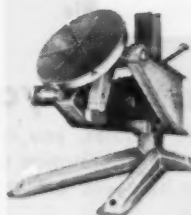


P&H WN-301 Engine-Driven DC ARC WELDER



It's portable—weld anywhere, anytime. Dial-electric Control gives you fingertip heat control at the work — for faster, better welding. Runs at only 1750 rpm. Welding service range, 60-375 amps. NEMA rated.

P&H POSITIONERS



One finger is enough to position heavy weldments for economical downhand welding. Capacities from 2500 to 36,000 lbs. — remote-control and hand-operated models.

Ask your P&H representative or distributor for complete information, or write for free bulletins.

P&H WELDING DIVISION
HARNISCHFEGER CORPORATION

4401 West National Ave., Milwaukee 46, Wis.

2495A

March 5, 1953

159

TWO NEW BUCKEYE Belt Grinding Attachments FOR CLOSE QUARTER WORK

Now—you can save up to 50% on grinding costs, even on close quarter work where every inch of free space counts! These two NEW Buckeye Belt Grinding Attachments are specifically designed for grinding on concave contours and confined areas.

The BGA-12 and BGA-24 models provide the same economy, efficiency and fine finish as the standard BGA-21 and BGA-42 models, PLUS extra maneuverability for working in close quarters. Choose now from four models . . . select the Buckeye BGA that meets your grinding requirements exactly.



BGA-21 2" diameter contact wheel mounted on tool spindle.



BGA-12 2" diameter contact wheel mounted on idler spindle.



BGA-42 4" diameter contact wheel mounted on tool spindle.

BGA-24 2 3/8" diameter contact wheel mounted on idler spindle.

• what are you waiting for?

In just two minutes, you can write for Bulletin S-13 and get complete information on all four models, any one of which can help you cut production time and costs.

Buckeye Tools
CORPORATION

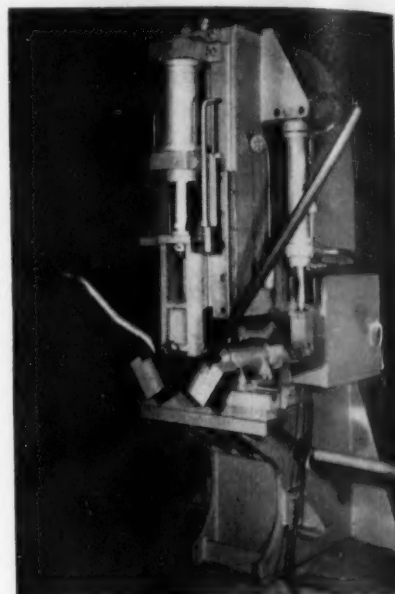
DIVISION 11 • DAYTON 1, OHIO

IN CANADA: Joy Manufacturing Co. (Canada) Ltd., Galt, Ontario

Portable Air
and Electric Tools
for Industry

New Equipment

Continued



Tube and pipe press

Among the features of a new 20-ton vertical ram-type tube and pipe bending press are twin equalizing cushion cylinders offset on the press frame to provide greater operating clearance. The fully-hydraulic, self-contained press also includes automatic angle-of-bend cycling with automatic return to starting position, variable speeds, oil coolers, single screw adjustment for wing dies, moveable foot control and shortened die holders. The unit has the power and capacity for repeat bending of 1/2- to 2-in. OD steel tubing with a maximum wall thickness of 0.083 in. without excessive wrinkling, flattening or distortion. *Pines Engineering Co., Inc.*

For more data circle No. 46 on postcard, p. 143.

Silver brazing flux

An improved version of the "1200" flux compound is the all-purpose silver brazing flux possessing superior cleaning and protective qualities in the brazing of ferrous and nonferrous metals. It consists of fluoride and borate salts and melts at a temperature lower than the alloys used. It may be used at all temperatures common to silver brazing. It does three things: covers the work and alloy, cleans off dirt and oxides, and reduces surface tension of the alloy so that it flows freely over the work. *American Platinum Works.*

For more data circle No. 47 on postcard, p. 143.

The Iron Age

INTRODUCES

W. B. Huntley, elected president and treasurer, WRIGHT-HIBBARD INDUSTRIAL ELECTRIC TRUCK CO., INC., Phelps, N. Y.; Richard E. Mayberry, named vice-president and sales manager; and C. J. Spacher, becomes vice-president and production manager.

Benjamin C. Betner, Jr., elected a vice-president, CONTINENTAL CAN CO., New York.

M. A. Travis, appointed vice-president in charge of sales and consulting services, Central States Region, RACK ENGINEERING CO., Connelville, Pa.

Howard H. Sharman, elected executive vice-president, RICKARD & CO., INC., New York.

William H. Phillips, appointed vice-president in charge of production, HAPMAN-DUTTON CO., Kalamazoo, Mich.

Gerald E. McEvoy, named director, vice-president and treasurer, PACIFIC TUBE CO., Los Angeles; and Kenneth M. Sime and M. J. Johnson, have been named assistant secretaries and assistant treasurers, of the company.

Robert W. Evans, appointed assistant director of public relations, Western District, U. S. STEEL CORP., Pittsburgh.

Francis T. Letchfield, elected to the board of directors, OLIVER UNITED FILTERS INC.

John F. Maisch, elected treasurer, E. F. HOUGHTON & CO., Philadelphia.

Curtis L. Bates, becomes director of engineering, RYAN AERONAUTICAL CO., San Diego.

Eugene B. Hotchkiss, elected chairman of the board, THE CRO-PLATE CO., INC., Hartford.

L. C. Perkinson, elected vice-president, AMERICAN CYANAMID CO., New York; and G. C. Walker, elected treasurer.

Del Roskam, promoted to vice-president—Manufacturing in charge of all manufacturing operations, CESSNA AIRCRAFT CO., Wichita, Kan.

Lloyd W. Wendell, named executive vice-president, FEDERAL STEEL WAREHOUSE CORP., Dayton.

William L. Manly, named assistant director of sales, General Machinery Div., ALLIS-CHALMERS MFG. CO., Milwaukee; John G. Christfield, Jr., appointed to Washington D. C., district office; Duke R. Silvestrini, assigned to Newark district office; and Elbert R. Nuttle, Jr., goes to Baltimore district office.

Harold W. Comfort, elected to the board of directors, COMMERCIAL SOLVENTS CORP., New York.

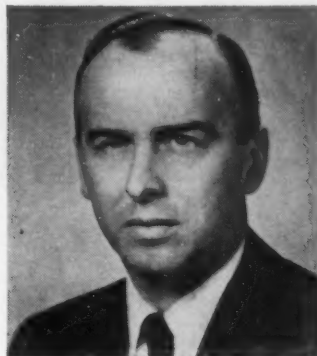
Dorothy M. Bryant and Jerome Linder, become chemists in the Development & Research Dept., HOOKER ELECTROCHEMICAL CO.; Neil F. Tomlin, appointed a draftsman; and Ormond W. Gay, becomes a mechanical engineer in the Engineering Dept.

Doyle Beasley, promoted to assistant superintendent of all night operations, TEMCO AIRCRAFT CORP., Dallas; and Jack L. Crowson, becomes assistant superintendent of Flight Ramp and Modification.

Charles C. Conley, appointed to newly created position of supervisor of research, HOUDAILLE-HERSHEY CORP., Detroit.

Herman A. Schaefer, elected secretary, HEWITT-ROBINS INC., Stamford, Conn.

Cliff M. Estes, elected to membership in the CONTROLLERS INSTITUTE, New York




RUSSEL J. KELLER, becomes engineering assistant to the president, Cleveland Welding Co., subsidiary of American Machine & Foundry Co.



VICTOR BROWN, elected a vice-president, Kropp Forge Co., Chicago.



PAUL McVICKER, appointed technical director of operations of Electro Metallurgical Co., a division of Union Carbide & Carbon Corp.



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Robert S. Ford, elected deputy assistant secretary, THE TAFT-PIERCE MFG. CO.; and Lafayette A. Hays, elected deputy assistant treasurer.

Vincent J. Volpe, appointed a research engineer, Propulsion and Structural Research Dept., Armour Research Foundation, of ILLINOIS INSTITUTE OF TECHNOLOGY.

James L. Willis, appointed senior sales engineer for basic refractories and chemicals, Eastern Seaboard, Chemical Div., KAISER ALUMINUM & CHEMICAL SALES, INC., Oakland, Calif.

John E. Courtney, appointed grinding wheel sales engineer, Detroit, ELECTRO REFRACTORIES & ABRASIVES CORP., Charles W. Anthony, becomes grinding wheel sales engineer, Central Ohio; and Sterling Muck, named grinding wheel sales engineer, Pittsburgh.

Kilbourne Knox, Jr., becomes staff engineer in charge of engineering on the company's program on aircraft hydraulic equipment, PARKER APPLIANCE CO., Cleveland.

Howard R. Silverthorn, named plant engineer; Engine Plant, Trenton, Mich., CHRYSLER CORP.; and N. R. Gorris, named master mechanic.

John H. Kilmer, Jr., appointed chief engineer, GOLDEN-ANDERSON VALVE SPECIALTY CO., Pittsburgh; and Paul A. Brauer, appointed assistant chief engineer in charge of production.

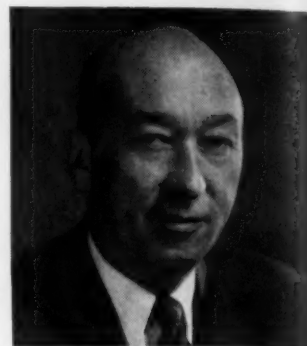
Jack Hauser, becomes the head of the San Francisco office of AMPEX ELECTRIC CORP., Redwood City, Calif.

Leslie E. Baker, appointed manager, Toledo branch, FRUEHAUF TRAILER CO.

John E. Zollinger, promoted to manager of defense contracts, INTERNATIONAL BUSINESS MACHINES CORP., New York.

John E. Thompson, Jr., appointed assistant to general superintendent, Gary, Ind., Sheet & Tin Mill, U. S. STEEL CORP.

W. H. Paul, appointed manager, Braddock, Pa. plant, AMERICAN CHAIN & CABLE CO. He succeeds his father W. C. Paul, who retired recently.



R. L. HANES named assistant to the vice-president—sales, The Colorado Fuel & Iron Corp., Denver.



PETER WOJTUL, named director of sales, Continental Can Co., Inc.



CHARLES B. STAUFFACHER, appointed control officer, Continental Can Co., New York.



T. V. PICRAUX, named production manager, Lincoln Engineering Co.



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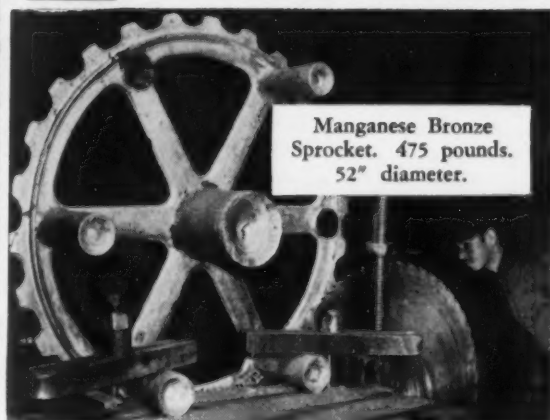
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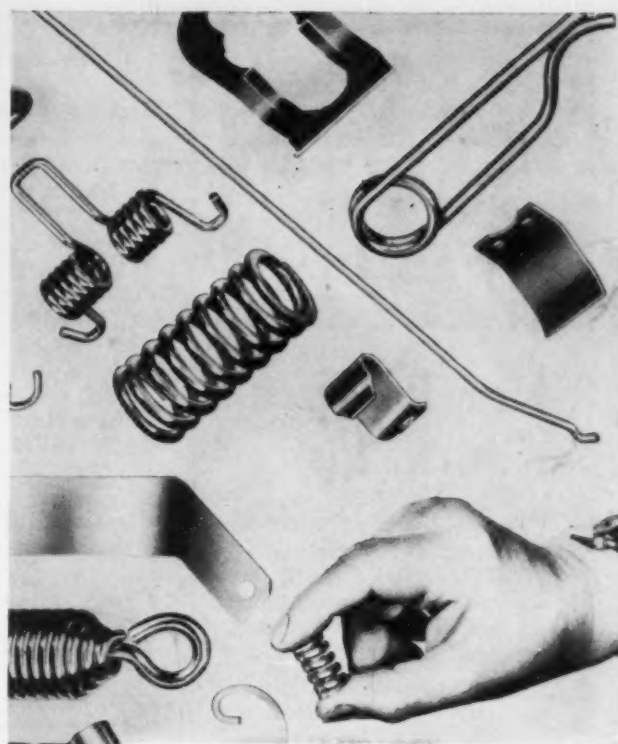
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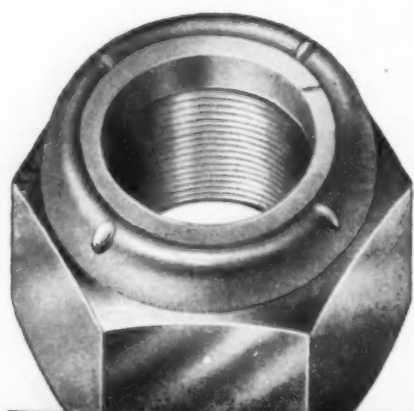
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J. W. Everson, appointed assistant manager, Market Research Dept., THE DOW CHEMICAL CO., Midland, Mich.

Alexander McKenzie, named district sales manager for parts of Ohio, Pennsylvania and West Virginia, MILLER ELECTRIC MFG. CO., Appleton, Wis.

Robert H. Chaffee, appointed sales manager, Heating & Cooling Products, TACO HEATERS, INC., Providence, R. I.

Orren R. McJunkins, named general manager, southeastern district, Metal Div., CONTINENTAL CAN CO., New York.

Dr. Richard W. Porter, named general manager, Guided Missiles Dept., GENERAL ELECTRIC CO., Schenectady; and Fred B. Law, appointed general manager, Aircraft Products Dept., Johnson City, N. Y., plant.

J. Louis Irwin, promoted to manager, Labor Relations, Industrial Relations Div., LUKENS STEEL CO., Coatesville, Pa.; A. B. Steele, promoted to manager, Personnel Administration; Earle R. Woodhull, becomes wage and salary administrator; Charles R. Vandever, named assistant to manager, Labor Relations; Ben R. Slocum, named supervisor, Employment; and Elliott R. Jones, named manager, Public Relations.

Edmund T. Morris, appointed assistant manager, Atomic Power Div., WESTINGHOUSE ELECTRIC CORP., Pittsburgh.

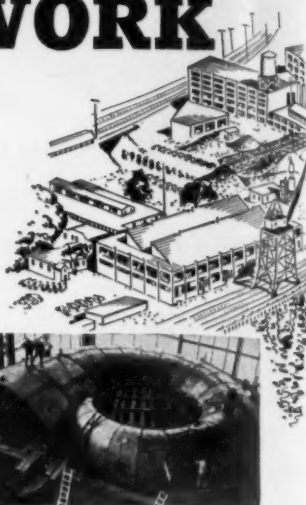
W. Ross Eames, promoted to assistant to the general manager, EATON MFG. CO.; Pump Div. Louis A. Selin, named assistant sales manager; Nicholas A. Noreyko, becomes assistant chief engineer; and Richard H. Berge, promoted to assistant plant manager.

George L. Cobb, promoted to general sales manager, SOULE' STEEL CO. He succeeds E. B. McClure, who has been promoted to assistant to the president in addition to being vice-president.

Irwin Colman, appointed assistant sales manager in charge of Hydraulic Components, GREER HYDRAULICS, INC., Brooklyn.

Robert M. Erskine, appointed special products manager, CRIBBEN & SEXTON CO.

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Kenenth E. Blessing, appointed New York district manager in charge of all activities, AMERICAN WHEELABRATOR & EQUIPMENT CORP.

Thomas E. Berry, named district manager, New York territory, DEWALT INC., Lancaster, Pa.

Walter C. Broach, appointed southern sales manager, Feed Phosphate Dept., Phosphate Div., INTERNATIONAL MINERALS & CHEMICAL CORP., Chicago.

James F. Drylie, appointed assistant sales manager in charge of the Sup-R-Guy Products Div., GUIBERT STEEL CO., Pittsburgh.

Albert J. Gruenewald, appointed sales manager, Industrial Div., LINCOLN ENGINEERING CO., St. Louis; and Robert E. Redenbaugh, appointed manager, Original Equipt. Div.

George A. Fort, promoted to general manager, Rubber Div., PARKER APPLIANCE CO., Cleveland.

H. Allen Thompson, appointed sales representative, THE H. K. FERGUSON CO., Cleveland.

Paul L. Thornburg, appointed factory representative in the mid-south, UTICA DROP FORGE & TOOL CORP.

Carl H. Drenske, appointed west coast representative, REPUBLIC MFG. CO., Cleveland.

Thomas S. Lynch, appointed traffic manager, JAMES HUGHES, INC., New York.

W. Orville Wilson, named purchasing agent, Atkins Saw Div., BORG-WARNER CORP., Indianapolis. He succeeds W. N. Springer, who has retired.

Walter E. Bornemann, appointed representative in Mississippi-Louisiana, H. H. BUGGIE & CO., Toledo.

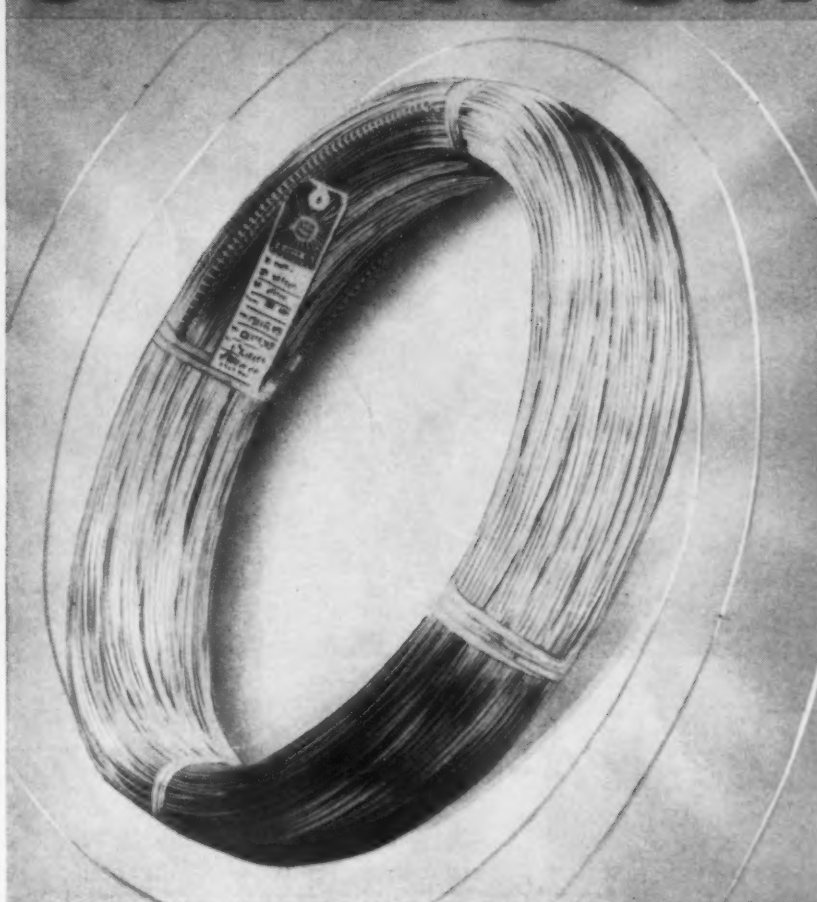
John Sutcliffe, appointed personnel manager, Milwaukee works, CHAIN BELT CO. of MILWAUKEE.

James E. Krajovic, appointed purchasing agent, Brosius Div., SALEM-BROSIUS, INC., Pittsburgh. He succeeds Alfred G. Lewis, who is retiring.

OBITUARIES

Jacob D. Cox, Jr., Cleveland Twist Drill Co., recently. He had been president of the company from 1919 until 1952 when he became chairman of the board.

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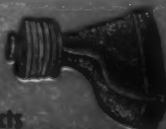
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Cuts Costs of Thin-Wall Parts



By W. N. Parker
Development Engineer
Radio Corp. of America
Lancaster, Pa.

- ♦ A good drill press and some inexpensive forming tools, are all you need to produce thin-shelled parts by the Uniskan extrusion method.
- ♦ It's an extrusion process that looks like spinning but isn't . . . Reductions as high as 30 to 1 can be achieved on metals ranging from soft copper through molybdenum.
- ♦ Fragile, cylindrical parts with wall thicknesses of 0.001 in. are easily made at a fraction of the cost of other methods . . . Etching is used to "cut" the metal cage.

♦ **HARD TO MAKE PARTS** for electron tubes are being produced rapidly and at low cost by an unusual metalworking process known as Uniskan extrusion at the Radio Corp. of America plant in Lancaster, Pa.

Design of fragile parts used in electron tubes often challenges metalworking facilities. One recent tube design called for a tubular electrode support having a seamless foil-like wall. Another design required a one-piece grid structure consisting of hair-like strands joined to cylindrical supporting members. Both parts seemed practically impossible to make with conventional metalworking processes. A solution was found in a metalworking process described as Uniskan extrusion. Precision parts are made by an easily executed rolling procedure involving simple tools mounted in a drill press.

The 0.001-in. wall tubular part, Fig. 1, is used as a heat-isolating support for an indirectly heated cathode in an electron tube. Heat isolation is further enhanced by making the part of Kovar, an iron-nickel-cobalt alloy of relatively poor thermal conductivity. The thicker end portions of the part strengthen the foil-like cylinder and permit it to be joined to the cathode by radio-frequency induction welding.

Fabrication consists of several simple steps. A short tubular work blank is slipped over a mandrel. Mandrel and work blank are rotated, and rollers are fed into the work blank to within

0.001 in. of the mandrel. Spacing of the roller from the mandrel determines the thickness of the thin wall. A small axial force is next applied to the rotating work blank, forcing the metal through the rollers to form a foil-like tube closely fitting the mandrel. When the thin wall is the desired length, axial force is removed, rollers backed off, rotation stopped, and the finished part slipped off the mandrel.

Fig. 2 shows the equipment used for this operation. Rotational and axial forces are provided by the small drill press. The mandrel rotates in a separate bearing and has a toothed collar to drive the end of the work blank. The frame carrying the rollers, Fig. 3, is self-centering and has an adjustable screw for determining the wall thickness of the thin-walled tubing. Three rollers are used, two fixed and one adjustable; all are mounted on precision needle bearings.

Remarkable reduction in wall thickness can be achieved in a single pass through the rollers. In the above example the reduction was greater than 30 to one. This order of reduction is believed possible only with extrusion of some sort, in which plastic flow is due to hydrostatic pressure set up in the unprocessed material.

A second unusual feature is the relatively small applied force required, a light pressure on the handle of a small drill press. Evidently the large unit pressure required to cause cold metal to flow is restricted to a very small volume closely associated with the region in contact with each of the rollers. These localized geometric volumes are then scanned through the work material in helical patterns, with the result that the thick-walled blank is forced out into a thin-walled cylinder without loss of material. This process, as a "single-scan extrusion," was named Uniskan.

Fig. 4 illustrates the action of the material at the roller. The outer face of the roller has a bead of small radius. As this bead is forced radially into the rotating tubular work blank, the work material tends to "squeeze out" each way along the mandrel. Application of a relatively small additional axial force from one direction causes practically all of the "squeezing out" to take place on the opposite side of the roller.

When the roller has been fed into the work to

the desired spacing from the mandrel the axial force is increased somewhat, causing new material to be forced under the bead of the roller to form additional thin tubing. A shoulder on the roller face is useful in maintaining high pressure in the local region immediately behind (to the left of) the roller bead.

Another characteristic distinguishing Uniskan extrusion is the application of all forces required to accomplish forming through the relatively thick work blank. After the material has been thinned, it need transmit no forces whatsoever. This is in sharp contrast to metal spinning, in which practically all driving forces are transmitted through material which has already been

SIMPLE TOOLS . . .

A drill press, special mandrel and set of rollers are all you need to make small cylindrical parts with wall thicknesses down to 0.001 in. . . . Reductions better than 30 to 1 are possible . . .

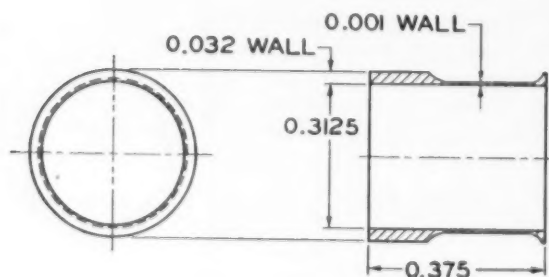


FIG. 1—Foil-like wall of this heat-insulating support is formed in a single pass. Thicker end portions add strength to delicate part.

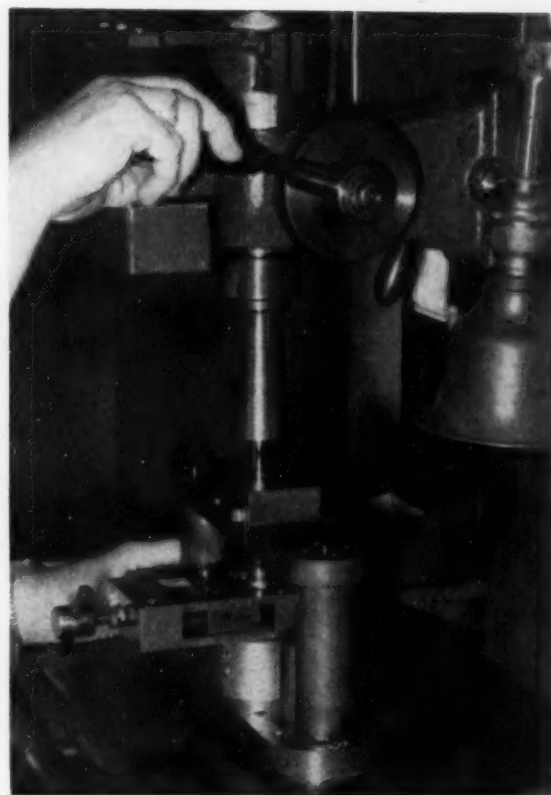


FIG. 2—Only simple equipment is needed. Tubular blank on mandrel is rotated between rollers. Pressure on drill-press feed lever extrudes the part.

thinned. Ultimate wall thinness which may be achieved with spinning and turning methods is severely limited by the lack of strength of the partially thinned material. With the Uniskan extrusion process, however, in which the driving forces are all transmitted through the thick blank, it is relatively easy to obtain tubular members several inches long having wall thicknesses of less than 0.001 in.

Grid structures for electron tubes, which must fulfill certain functional requirements, are made by a slight variation in the process used for thin-wall tubing. Good tube performance requires a grid structure designed to keep the grid wires cool. One such design consists of a cylindrical

FOR UNUSUAL PARTS . . .

Use this method to make parts usually considered too fragile for normal metalforming methods . . . Get a ribbed structure by using a serrated mandrel. Etch out the web for cage type parts.

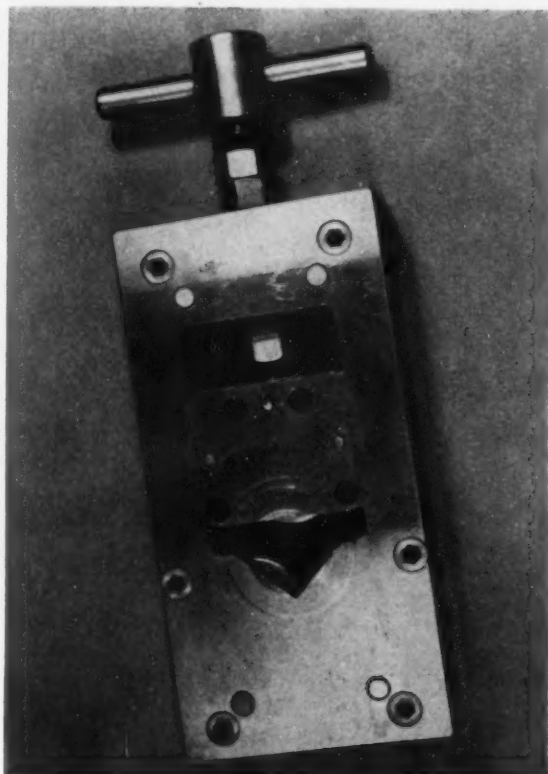


FIG. 3—Frame carries two fixed rollers and a third which may be adjusted during operation by a feed screw. Rollers turn on precision needle bearings.

array of straight, fine strands formed integrally with relatively heavy tubular end support members, Fig. 5. Elimination of welds or other joints materially aids conduction of heat away from the grid strands. Cooling may be further enhanced by the use of oxygen-free high-conductivity copper in the one-piece grid.

Fabrication of a one-piece grid by Uniskan extrusion differs from the thin-wall tubing procedure in two respects. First, the mandrel must be provided with longitudinal grooves which determine the number, size, and shape of the grid strands. A typical grid mandrel is shown in Fig. 6. During the pass through the rollers, material is forced into these grooves. The part, as taken from the mandrel, consists of a cylindrical array of ribs connected by a foil-like webbing. Removal of the webbing yields the desired grid.

The web is removed by dipping the part in an etching bath for a few seconds. The interconnecting web disappears, leaving an accurately formed grid structure free from stresses which might later cause deformation.

The grid, Figs. 5 and 7, consists of 60 strands, each 0.005 in. wide. In spite of the delicate nature of this grid structure, the part may be readily handled by means of the heavier supporting portions. The portion of the support just below the grid strands is formed into an accurate cylindrical jiggling surface by an additional step in the rolling procedure. After the desired length of grid strands has been rolled, the rollers are partially backed off and the axial feed continued for a short distance.

The work blank for this grid is a drawn cup consisting of two sections of different diameter. The spoke-like end is formed by the fabrication and then the chemical removal of the web between the spokes. Grids made by this method cost only a fraction of older types made by hand-threading and spotwelding molybdenum wire to nickel tubular supports.

Larger-diameter grids are shown in Figs. 8 and 9. Grids have 180 strands, each 0.010 in. wide.

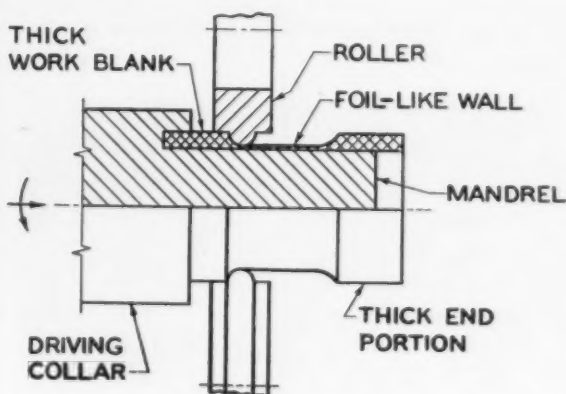


FIG. 4—Rotational and axial driving forces transmitted through the work blank force material to flow between the mandrel and the bead on the rollers.

Mandrels and rollers should be carefully made . . . Slight roughness may be objectionable . . .

Strands must be exactly straight and accurately indexed to provide exact registry with other parts of tube structure. For the grid shown in Fig. 10, the work blank is a relatively long piece of copper tubing which subsequently is used to connect the electron tube to the vacuum pump during exhaust.

Grid structures made by the above procedure cover a wide variety of designs. A structure consisting of tapered slats integrally formed with end rings is shown in Fig. 11. The grooves in the mandrel for this grid vary in width at a somewhat greater rate than the desired part to allow for elongation of the work during rolling.

The one-piece grid, Fig. 12, consists of rela-

tively few coarse grid strands arranged in a slow spiral. During rolling, the partially completed part simply untwists along the grooves in the mandrel. Another design, Fig. 13, has grid strands arranged in a zig-zag pattern. The mandrel, Fig. 14, is made in three pieces. Initially, rolling is started over the spiral section remote from the shank of the mandrel and the formed ribs follow the grooves as before. As the rolling progresses both spiral sections slide out of the tubular shank, Fig. 15, as the work elongates.

An interesting variation uses a single roller which bears against a flat work blank mounted on a smooth rotating face plate. As the roller moves outward, thinned material rises from the face plate to form a cone, Fig. 16.

Mandrels and rollers should be carefully made if high-quality parts are desired. Slight roughness or eccentricity may become quite objectionable when wall thicknesses are rolled to 0.002 or

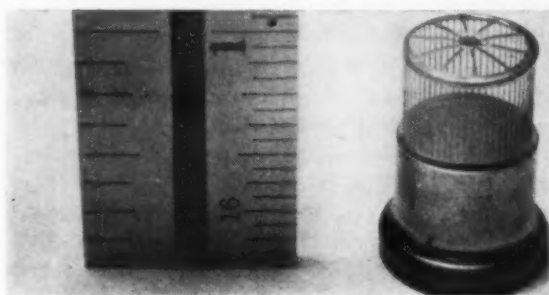


FIG. 5—Completed one-piece copper grid electrode. The 0.005-in. wires are formed integrally with thicker end supports. Accurate jiggling cylinder is also formed.

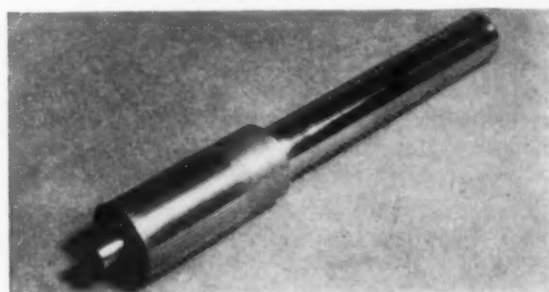


FIG. 6—Grooves ground in the polished mandrel determine the number, size, and shape of the strands in grid electrode made by Uniskan extrusion.

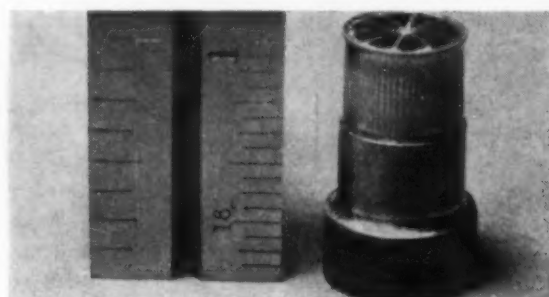


FIG. 7—Partially completed grid is a foil-like cylinder having thicker longitudinal ribs along inner surface. Ribs become grid strands when the web is etched out.

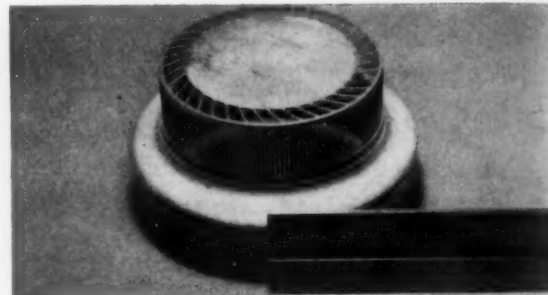


FIG. 8—Large diameter one-piece grid has 120 strands, each 0.010 in. wide and is used as the screen electrode in a high-frequency power tetrode.

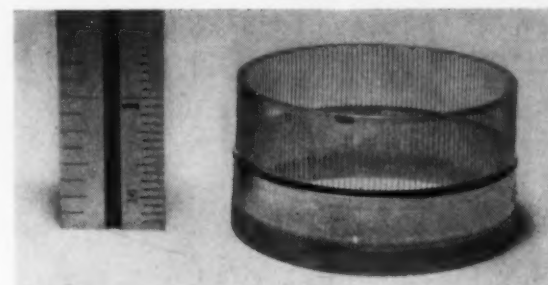


FIG. 9—Exact shape and alignment are maintained with only a light connecting ring. Structure is possible because of weak, uniform residual stress pattern.



FIG. 10—Electrodes may be formed integrally with other functional parts. This grid is made on one end of a copper tube used to evacuate the electron tube.

0.003 in. Successful mandrels have been made of a low-chromium alloy steel, heat treated by packing in clean cast-iron chips and heating at 1775°F for 20 min. After being heated, mandrels were quenched in oil and drawn twice, each time for 1 hr at 212°F. Hardness measured 64 to 66 Rc. Each mandrel was then ground to diameter and polished, after which the grooves were ground with a suitably thin wheel mounted between supporting plates.

Accurate measurement of groove depth presented a problem in making a mandrel for a grid having 90 0.003-in. strands. The method adopted utilized an additional portion of the mandrel having a diameter equal to the inside diameter of the finished grid and a slight known taper. As each groove was ground, a mark was made along the tapered section by the wheel. The length of the mark along this taper provided a convenient check

on uniformity of groove depth and made it very easy to allow for grinding-wheel wear.

Rollers have been made of a high-carbon tool steel heated for hardening to 1525° to 1550°F in an oxidizing atmosphere for 15 min, quenched in oil, and drawn at 300°F for 1 hr. Hardness measured Rc 64. The radius of the bead, which is not particularly critical, was 0.062 in. on a 1-in. diam roller for the type of work shown. It is desirable that the rollers run as true as possible to give a smooth polished finish on extruded parts.

Materials suitable for use with the Uniskan extrusion process range from soft copper to harder materials like molybdenum. A suitable etchant for grids made of copper is a 30 to 50 pct solution of nitric acid in distilled water. Other metals require different etchants. For example, tantalum requires hot hydrofluoric acid with a trace of nitric acid added.

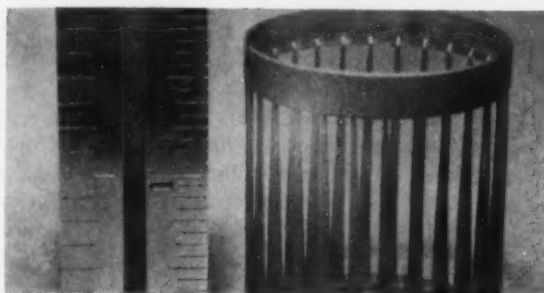


FIG. 11—Tapered slots of this structure are obtained by using a mandrel with grooves of varying widths. Allowance in grooves takes care of work elongation.

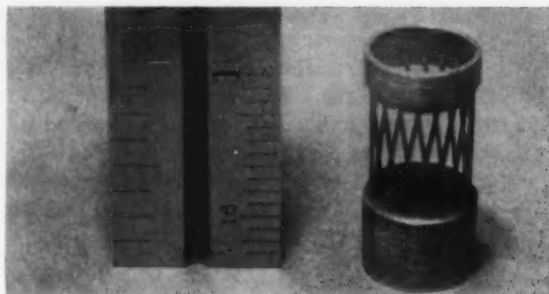


FIG. 12—A spiral grid results when the mandrel is spirally grooved. During rolling, parts simply untwist along the grooves in the mandrel.

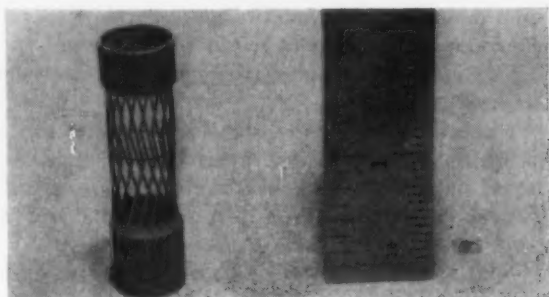


FIG. 13—One-piece zig-zag structure is provided with an interconnecting ring at the junction of the two spirals. The web has been etched out.

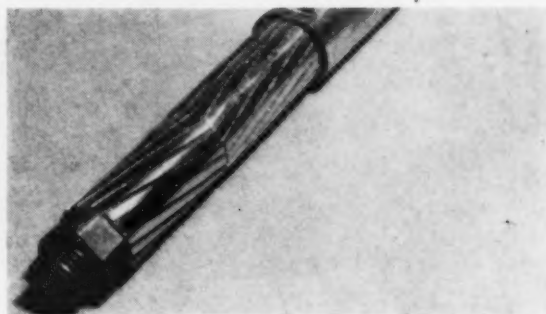


FIG. 14—A three-piece mandrel permits removal from the zig-zag grid. Parts fit without looseness. Locked unit slides out of shank as work elongates.

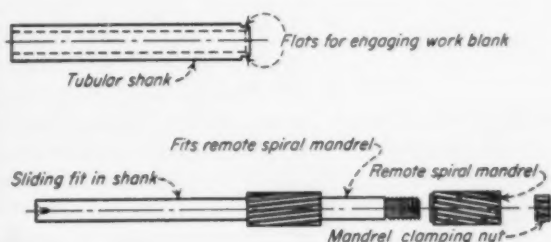


FIG. 15—Exploded view of three-piece mandrel used to make zig-zag grid. Two spirally grooved sections are held together by clamping nut.

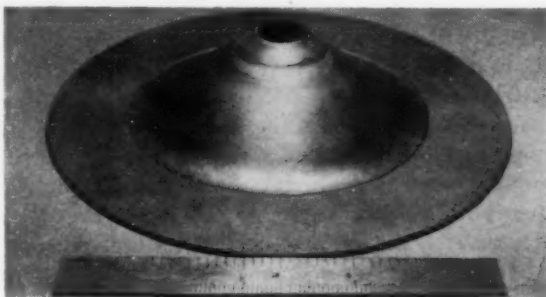


FIG. 16—A self-formed cone may be made directly from a flat sheet. A single roller bears against a work blank.

Don't throw it away—

Worn Plastic-Coated Gloves CAN

♦ A new method of reconditioning plastic-coated gloves may add as much as 100 pct to their working life.

♦ Coated work gloves can be reconditioned at low cost by reinforcing breaks and redipping in a conditioned bath.



By W. G. Patton
Asst. Technical Editor

♦ UP TO 90 PCT of plastic-coated workmen's gloves once discarded can be reconditioned and reused according to officials of U. S. Industrial Glove Corp., Detroit.

Plastic-coated cotton gloves can now be reconditioned at a fraction of the price of new gloves. This may add as much as 100 pct to their serviceability. The new method is applicable to plastic-coated cotton gloves of both smooth and rough texture. Service cost includes door-to-door pickup and delivery through 57 outlets in 20 states, from the eastern seaboard to Texas.

The new Glovo Over-Kote process has been developed in response to the increasing requests of users of plastic-coated work gloves. Included among users are stamping plants, metal-finishing plants, steel fabrication, steel warehouses (particularly slitters and cutters), automobile and appliance assembly plants and transmission plants.

Plastic-coated gloves are also being used in increasing quantities by the chemical and oil country goods industries. Dipping a new canvas glove

in a plastic coating has been found to add greatly to the wear resistance of the glove. The dipped gloves resist tearing, scuffing, cutting and seam breakdown. A soft cotton interior minimizes hand sweating.

The plastic coating is black and evenly applied. The coating is firm and bonds readily (under special curing) to the original plastic surface. Repaired gloves can be laundered satisfactorily. Repair areas are identifiable but hardly noticeable. A special technique for resealing provides reinforcement of the break as well as rebuilding of the plastic to the original thickness. Large open areas, seemingly rendering the gloves useless, can be adequately closed. Small breaks in the plastic coating, gouges and cuts are readily sealed, regardless of where they may occur.

Fig. 1 shows a plastic-coated glove before and after repairing. The plastic coat gives reconditioned gloves a "better-than-new" appearance. Pliability is equal to the original. The coating is not tacky and, in many instances, outwears the coating originally applied by dipping.

After laundering to remove soil, grease and other foreign materials, the gloves are dried and sanitized by exposing to 250°F heat. They are then mounted on aluminum hand forms that expand the gloves to their original dimensions, Fig. 2. Thumbs and fingers are forced to take their original shape.

A specially formulated solution is applied to repair areas, under temperature-controlled conditions, in conjunction with a reinforcing agent. The combination is then heat-sealed, insuring a strong permanent bond.

Next the entire glove, Fig. 3, is recoated in a mechanically conditioned vat of the plastic. Steps are taken at this point to prevent oxidation of the bath. After the film of "Over-Kote" fresh plastic has attained proper depth and con-

ves CAN BE RECLAIMED



FIG. 1—Plastic-coated gloves, before and after repairing. Sizable holes can be mended by redipping.



FIG. 2—Gloves are mounted on cast aluminum forms during redipping. Form inserts are used for fingers and thumb.

sistency, the gloves are placed in a specially engineered convection oven at 350°F, Fig. 4, and held through a controlled curing cycle. After removal from the oven, a timed cooling period is



FIG. 3—A conditioned vat is used to apply the plastic coating. Steps are taken to prevent oxidation of the bath.

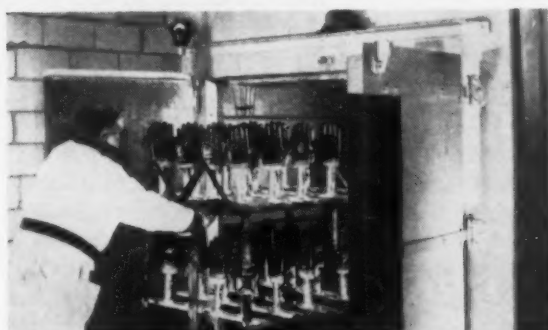


FIG. 4—After dipping, gloves are held in a convection oven at 350°F. A carefully controlled time cycle is used.

necessary. Failure to reduce the temperature of the gloves and forms at the proper rate can result in cracking and peeling, rendering the product useless. The gloves are then inspected, paired and packaged for return to the customer.

Percentage of salvage of plastic gloves, 75 pct, is anticipated to exceed substantially that of cotton and leather gloves. High salvage percentages are best attained however by an effective in-plant policy which prevents the complete disintegration of the glove in the original wearing. Excessive wear not only prevents high salvage rates but also reduces safety factors to a point of hazard.

WHAT DOES TACONITE MEAN TO YOU?

The first complete article on taconite beneficiation will appear next week in *THE IRON AGE*. Prospects of diminishing iron ore reserves have long haunted the steel industry. This spectre has been banished by the successful establishment of the new taconite beneficiation industry. Here are facts and figures on this new industry—the who, what, when, where, why and how of taconite.

A year in the making, this story is presented in two sections: Taconite, Mesabi's Answer to The Iron Ore Problem, and Reserve Mining Takes Wraps Off Benefication Plant.

The first section tells who's in the business, planned tonnages, locations of plants, extent of investment, type

of product to be made, estimated production figures. The second section opens to public view for the first time Reserve Mining's operating taconite beneficiation plant.

Solution of the many technical, managerial and financial problems connected with development of taconite reserves, is the nation's guarantee against exhaustion of native ore. Taconite creates a strategic stockpile in open pit reserves by supplementing existing ore supplies. Taconite can prevent dislocation of existing steel production and consuming centers. Its use points the way for solving other major shortages. Here is an article of major importance to every steel user. It is an article you will want to read.

How and Where To Use 430 Stainless

- ◆ If you're having trouble getting high-nickel stainless, the straight chromium grades may make satisfactory substitutes for your products.
- ◆ Some slight adjustment in fabricating methods may be needed . . . Free machining 430F is close to mild steel in machinability.
- ◆ Titanium added to 430 improves ductility of welds if proper welding methods are used . . . Ductility of welded 430 can be improved by a simple heat treatment.
- ◆ Avoid straight chromium grades where nonmagnetic properties, toughness at sub-zero temperatures, or high strength at high temperatures are must requirements.

By R. A. Lincoln and T. A. Pruger

Sales Development and Engineering Service Dept.
Allegheny Ludlum Steel Corp.
Pittsburgh

Part II

◆ TYPE 430 STAINLESS steel can be a satisfactory substitute for 18-8 stainless in many applications where corrosion factors are mild, yet of prime importance, and where other special properties are not needed. Where corrosion conditions are severe, type 442 should be considered.

In special applications requiring ductility at sub-zero temperatures, high strength at elevated temperatures, or non-magnetic properties, the straight chromium grades are not adequate substitutes. In many cases, however, substitution of the straight chromium grades for 18-8 is practical.

Use of straight chromium stainless may require special considerations in order to fabricate equivalent finished articles. This may result in additional operations and costs over those established for 18-8 steels. A case in point is welding. Although welding affects the properties of straight chromium steels, they can be used in the as-welded condition. When necessary, weld properties can be restored to those of the base metal by a simple heat treatment.

Straight chromium steels as supplied by the mill in the annealed condition, have good mechanical properties. But their mechanical properties show up to poor advantage when compared with those of the austenitic stainless steels. The same

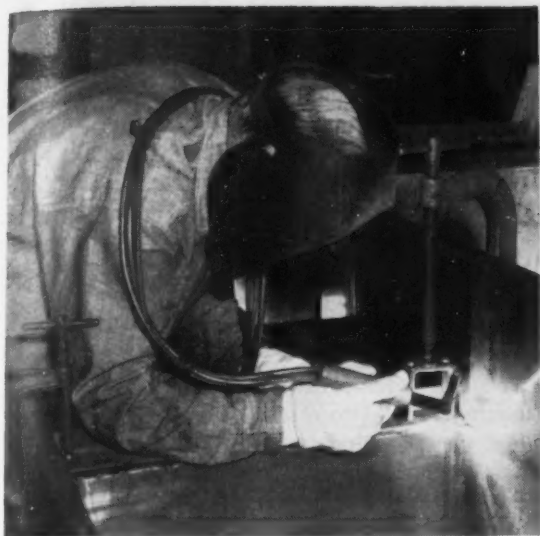
would be true of many other useful alloys if such a comparison were made.

The results of typical tensile tests on mill-annealed, flat-rolled products are shown in Table IV. The ductility of the material is good and it is possible to satisfactorily form and draw it in much the same manner as deepdrawing carbon steel can be worked with. The tensile strength and hardness however, are somewhat higher than carbon steel, but the rate of work hardening is quite similar.

Little can be done to increase the annealed strength of straight-chromium steels and they do not offer much possibility in such applications as a substitute for austenitic steels.

At times, difficulties have been encountered in the drawing of type 430. Some of the problems include stretcher strains, directionality and a ropy condition. Stretcher strains occur in light-gage, dead-soft material when the steel is stressed beyond the yield point, and increasing the thickness may decrease the tendency for stretcher strains to form. In some instances, stretcher strains are prevented by giving the steel a skin pass as the final mill processing. This processing, however, lowers the ductility for subsequent drawing.

Directionality in type 430 strip and sheet strip is attributed partially to the absence of cross-rolling and to a low-annealing temperature. The low-annealing temperature of 1450°F does not allow full recrystallization. The higher-annealing temperature of type 302 strip permits complete recrystallization and eliminates most, if not all, directionality. Directionality is reflected in the bendability of type 430 strip which shows better



STRAIGHT CHROMIUM stainless may be substituted for 18-8 stainless steels in many cases. Fabrication costs may be slightly higher with straight chromium stainless.



TYPE 430 STAINLESS makes a satisfactory substitute for 18-8 where corrosion conditions are mild, as in these food handling units at a Naval hospital.

bendability with the axis perpendicular to the direction of rolling than parallel to the direction of rolling. Type 430 strip and sheet strip are being produced which will satisfactorily pass a bend test over a radius equal to the thickness, regardless of the direction of bend.

The exact cause of the ropy condition which sometimes occurs in drawing type 430 is not known. This condition may be due to a preferred recrystallization texture that results from rolling in one direction. Its appearance is characterized by the presence of concentric ridges on certain drawn surfaces.

Roping generally occurs when the material is stretched during drawing instead of being allowed to flow over the die ring. If roping is more severe than normal, consideration should be given to the possibility of eliminating stretching as much as possible. In eliminating irregular surface conditions, consideration should be given to the use of relatively heavier gages in type 430 than would be used in a comparable draw employing type 302. The severity of the individual draws should be reduced and possibly a greater number may be given between anneals.

It is suggested that the diameter of a straight-chromium blank be increased as compared to a type 302 analysis in drawing similar items. This consideration plus less effective hold-down pressures allow the metal to flow over the die ring rather than "neck down" locally, and eventually fail through cracking. Since the surface of 430 may be smoother than 302 actual hold-down pressure may be higher, but the effective hold-down lower. In some instances, turning the cup inside out during redrawing has helped eliminate the roping.

Type 430 has an advantage over type 302 in drawing operations requiring intermediate anneals. The low annealing temperature of 1450° to 1550°F for type 430 produces only a thin oxide

film which in many processes does not interfere with subsequent drawing. If a pickled surface is desired, removal of this slight scale by pickling is easier.

Type 430 can be welded by the conventional methods, but certain precautions must be observed. The grain-boundary martensite must be tempered by a high-temperature draw, 1200° to 1400°F, or an actual annealing treatment, 1450° to 1500°F, must be given to the welded material in order to obtain optimum ductility. Where heat treatment is not practical, type 310 electrodes have been used in welding type 430 with some degree of retention of ductility.

It is generally the practice to weld with an austenitic rod, such as type 310, when it is not possible to heat treat after welding and to use a 17 pct Cr rod when the weld can be heat treated. In many instances where welding is required in fabrication, these steels are giving satisfactory service in the as-welded condition but the effects of welding should be considered before they are used in such applications.

The mechanical properties of welded samples of type 430 can be restored so as to approach those of the annealed material with a simple heat treatment of a few minutes at 1450°F. In many applications, the lowered ductility present in the as-welded condition is not detrimental and type 430 is giving satisfactory service without heat treatment after welding. The tensile test results on welded specimens in Table V are representative of results obtained.

Effect of heat treatment upon mechanical properties of type 430 Heliarc welds on 0.065 in. sheet is shown in Table V. Weld is transverse across the tensile specimen. Some variation in the properties of welds in type 430 is obtained and sometimes ductility is relatively high in the as-welded condition as shown by the test results in Table VI for Heliarc welded type 430 strip 0.025 in.

Slow the rate of cooling from welding heat to get better as-welded mechanical properties.

thick. The weld was transverse across the tensile specimen.

Bend tests on the as-welded sample cracked after bending 180° over a 0.060 in. diam. The latter as-welded result is unusually good. There is no established procedure that will consistently insure such good results in the as-welded condition. The effect of heat treatment after welding is consistent in type 430. Anything that can be done to slow down the rate of cooling from welding heat should help to improve the as-welded mechanical properties. These include such practices as preheating before welding of both the work, the jig and backup fixtures to as hot as is practical within the range of several hundred degrees over room temperature. In some instances, it may be practical to accomplish some improvement by heating locally with a torch after welding but in such an operation, it is difficult to control the temperature sufficiently.

430 with titanium gives ductile weld

When type 430 contains titanium in an amount equal to approximately seven times the carbon content, ductile welds are obtained in the as-welded condition when welds are made by processes that prevent the loss of titanium during welding. The results in Table VII illustrate the effect of titanium additions to type 430. Table VII shows results on Heliarc welds in type 430 titanium sheet 0.030 in. thick, containing 0.063 pct and 0.38 pct Ti. The weld was transverse across the tensile specimen.

Welds in type 442 do not follow the same pattern of behavior as welds in type 430. Type 442 behaves as though austenite is retained at room temperature in the as-welded structure and tempers relatively slowly at 1450°F. The results of mechanical tests on type 442 welds are not as consistent as tests on type 430 welds. Table VIII shows the results of several tensile tests on welds

in type 442 sheets. Samples from the 0.046 in. type 442 weld test pieces bent in the weld 180° over a 0.090 in. diam before cracking in all three conditions even though the tensile tests showed low elongations.

As would be expected variations in welding conditions can alter the results obtained. Table IX illustrates the results obtained on arcwelded ½ in. plate. Plate specimens were bent over a ½ in. diam which was too small for this gage material. The as-welded specimens cracked after bending 9° to 13° while the others bent 31° to 97° before cracking.

At subzero temperatures, type 302 behaves in a manner similar to other austenitic steels. Excellent ductility and impact strength is retained down to temperatures as low as -320°F. In fact, the impact strength increases slightly at these extremely low temperatures, while tensile strength shows a very rapid increase. Type 430 does not follow this pattern. The impact toughness of ferritic steels goes through a transition temperature in the vicinity of 0°F where impact values drop sharply and brittle failure occurs rather than a ductile fracture during rapid deformation. With slowly applied loads, as in a normal tensile test, ductility is not affected. Therefore, in low-temperature service the austenitic steels are recommended, because room temperature ductility and resistance to shock is retained at very low temperatures.

Type 302 resists progressive scaling up to a temperature of 1700°F and can be used in continuous service applications up to this temperature. For intermittent operation, a maximum temperature of 1600°F is advocated because of the tendency of the scale to spall off in cyclic heating. Type 430 resists progressive oxidation at temperatures up to 1600°F in intermittent service. For continuous service a maximum temperature of 1450° to 1500°F is recommended. Both types 302 and 430 form tightly adherent scales which resist removal, except under conditions as noted above. Type 302 is considerably stronger at elevated temperatures.

Short-time elevated temperature tensile tests not only indicate the strength at various temperatures, but also show hot-short ranges for the different steels. The ductility of type 302 is relatively low at 1200° to 1400°F. This is the hot-short range for this steel. Type 430, however, is not hot-short at these temperatures, although prolonged exposure at 800° to 1000°F does lower the room temperature ductility.

One drawback to the use of straight-chromium steels is their poor strength at elevated temperatures. Table X shows that type 430 and 446 are inferior to type 302 in high-temperature strength and would not be satisfactory substitutes where strength is of importance.

The straight-chromium grades do not work harden to any appreciable degree as do the chromium-nickel steels, and thus possess an important advantage in machining operations, permitting

TABLE IV

ANNEALED STRENGTH OF STAINLESS GRADES

Product	Tensile Strength, psi	Yield Strength, psi	Elongation, pct
Typical, type 302	90,000	40,000	50.0
430 sheet 0.065 in.	72,600	50,900	27.0
430 strip 0.025 in.	76,800	50,300	25.0
430 Ti sheet 0.030 in.	72,200	42,700	29.0
442 sheet 0.046 in.	66,300	47,900	21.0
442 plate ¼ in.	62,400	39,800	29.0

higher machining speeds. Free machining additions to the regular grades break up the continuity of the chip and lubricate the tool. The free-machining steels, type 303 and 430F, show markedly improved machinability as illustrated in Table XI.

TABLE V
EFFECT OF HEAT TREATMENT
ON WELDED STEELS
TYPE 430 SHEET
0.065-in. thick

Treatment	Tensile Strength, psi	Yield Strength, psi	Elongation, pct
As welded	82,400	50,300	7.0
As welded for 5 min at 1450°F	80,700	46,500	15.0
As welded for 1 hr at 1450°F	73,000	43,200	29.0

TABLE VI
TYPE 430 SHEET
0.025-in. thick

Treatment	Tensile Strength, psi	Yield Strength, psi	Elongation, pct
As welded	82,500	51,900	16.0
As welded for 5 min at 1450°F	83,100	55,000	17.0
As welded for 1 hr at 1450°F	82,500	51,900	23.0

TABLE VII
TITANIUM BEARING 430
0.030-in. sheet

Treatment	Tensile Strength, psi	Yield Strength, psi	Elongation, pct
As welded	74,400	48,700	21.0
As welded for 5 min at 1450°F	74,800	43,300	24.0
As welded for 1 hr at 1450°F	71,600	39,800	26.0

TABLE VIII
TYPE 442 SHEET
0.046-in. thick

Treatment	Tensile Strength, psi	Yield Strength, psi	Elongation, pct
As welded	74,200	54,400	20.0
As welded for 5 min at 1450°F	70,300	50,200	11.9
As welded for 1 hr at 1450°F	69,700	44,900	21.0

TABLE IX
HAND-ARC WELDED 442 PLATE
1/2-in. thick

Treatment	Tensile Strength, psi	Yield Strength, psi	Elongation, pct
As welded	75,300	59,300	3.5
As welded for 1 hr at 1450°F	71,000	49,700	8.5
As welded for 1 hr at 1550°F	72,200	49,600	13.5

The addition of free-machining elements does not appreciably affect the work-hardening characteristics of the austenitic steels, but higher speeds can be used because of reduced chip toughness and added lubrication. The free-machining 17 pct Cr steel, type 430 F, closely approaches mild steel in machinability, but because of its higher strength, more power is required.

Both compositions can be soft and silver soldered with a minimum of difficulty. Special stainless steel soldering fluxes should be used to etch or cut the metal prior to the actual soldering, so that a proper bond can be made. After soldering, it is essential that the surface be cleaned with an appropriate solution, such as alkaline ammonia water, and scrubbed to remove any trace of hydrochloric acid, which is one of the ingredients of some commercial fluxes. If this precaution is not taken, the acid will attack the metal.

In corrosion tests involving silver-soldered type 430 in continuous contact with moisture or in corrosive media containing salts or acids, there is a possibility of electrolytic action taking place at the interface with loss of bond strength. Tests on type 302 indicate that this type of attack is less likely to occur. Electrolytic attack in silver-soldered joints of type 442 is greater than 18-8 but is not as bad as type 430. Tests with a special silver solder containing nickel indicate less susceptibility to this attack. Covering the silver-solder deposit with a coating of soft solder appears to stop the action in the regular silver-soldered joint.

This concludes a two-part article.

TABLE X
CREEP STRENGTH OF 302 V. 430 AND 446

Testing Temperature	Creep Rate, 1 pct in 10,000 hr		
	Type 302, psi	Type 430, psi	Type 446, psi
1000°F	19,000	8,000	6,000
1200°F	7,500	2,000	1,000
1400°F	3,000	800	.....

TABLE XI
COMPARATIVE MACHINABILITY of
AUSTENITIC AND FERRITE STEELS

Grade	Type	Machining speed expressed in pct of sfpm commonly used for mild-steels-high speed steel tools
18-8	302	45
18-8 FM	303	80
17	430	55
17 FM	430 F	90

Plastics:

MACHINERY MARKET BOOMS

MOLDING MACHINES AND PELLET PRESSES

♦ Sales of both compression and injection molding machines have been high since 1945 . . . But more and more injection machines are being sold.

♦ Wider use of injection units reflects upswing in use of thermoplastic materials . . . Trend in compression press design is toward larger sizes.

♦ Look for more industry demand for completely automatic molding machines . . . Upright injection presses are getting more attention. Plants use much auxiliary equipment.

By H. R. Simonds
Consulting Engineer
New York

Third of a Series

♦ **CONSTANT DEMAND** for larger plastic moldings has led to development of impressive automatic molding machines. These rival in ingenuity and precision workmanship the elaborate presses of the metalworking industry.

In design of any fully automatic plastics molding machine, unusual mechanical problems must be solved in addition to meeting temperature and timing requirements of the material in process. Nearly all plastics molding operations produce a molded part plus the flash and sprue.

The classification "molding" includes compression, transfer and injection moldings. Extrusion also is usually considered a molding operation. Forming of reinforced plastics, as in construction of glass and resin automobile bodies, is often

loosely called molding. Molds and equipment used however are generally nonmetallic.

Some idea of the extent of the molding equipment industry may be had from Table I. About 500 compression presses and 750 injection presses were sold last year. This reverses the trend of a decade ago when yearly sales of compression presses were about double the sales of injection presses. The average injection press, by size, is a more expensive piece of equipment than the average compression press. Thus the swing to injection molding, trailing the swing to thermoplastics, is reflected in expansion of press manufacturing. A review of 1952 sales of one injection press maker indicated the 12-oz press is average. This press weighs 19,500 lb. Taking this weight as average for the 750 injection machines sold in 1952, we have a total of 14,625,000 lb.

Average compression press size reported by two companies is a 100-ton press weighing 10,000 lb. The 500 units sold in 1952 represent a total weight of 5 million lb. For both types, sales total about 20 million lb of metal, mostly steel, worth an estimated \$16 million. Auxiliary equipment, including preform presses, conveyers, instruments, heat exchangers, preplasticizing units, tumble barrels, molds, lift trucks for molds, and testing and finishing machines. All these would easily double the investment represented to \$32 million.

Thermosetting materials may be molded on automatic compression presses such as the one shown in Fig. 1. Automatic operation of these presses was developed 15 years ago and received great impetus during the war. Now almost all modern molding plants use automatic presses in addition to the older semiautomatic compression presses.

The press shown in Fig. 1 is a 50-ton automatic in operation at American Insulator Co., New Freedom, Pa. It is self-contained with a variable volume pump supplying the hydraulic circuit. The ram has fast travel except for controlled slow closing under pressure. A selector switch permits semiautomatic or fully automatic

HERBERT R. SIMONDS is a consulting engineer specializing in plastics. He is author or co-author of various books on plastics, including, "Handbook of Plastics." He was formerly on the editorial staff of THE IRON AGE and is now president of Hallmark Institute, Inc., New York City, a consulting firm.

TABLE I

MACHINES USED IN THE PLASTICS MOLDING INDUSTRY

	1945	1946	1947	1948	1949	1950	1951	1952
Compression Presses	12,000	13,000	13,500	14,000	14,500	15,000	15,300	15,800
Injection Presses	1,750	3,250	3,750	4,000	4,750	5,700	6,250	7,000

Sales in 1952 were: Compression, 500; Injection, 750.

operation. Only labor needed, it is claimed, is that required to fill the hopper and remove finished parts.

Thermostatically-controlled electrically-heated platens with complete control panel are mounted as part of the press. One valve controls ram pressure from 7 to 50 tons. Other controls include time cycle clock, oil temperature control and ram stroke adjustment. Base of the press is welded steel and the main cylinder and bed are cast steel in one piece.

The trend in compression press design is toward larger sizes. Fig. 2 illustrates this. Here three large presses are in operation at the plant of Chicago Molded Products Corp. on production of television cabinets. The unit in the foreground has a 78 x 53-in. bed area and a capacity of 1500 tons.

Compression and transfer presses

Fig. 3 shows a 60-ton preform press at work at the Bound Brook plant of Bakelite Co.

Compression presses, though generally less elaborate in construction than injection presses, are often highly specialized machines. An example is the automatic press for molding threaded phenolic bottle caps. An 850-ton press automatically puts the caps through an 8-operation cycle as shown in the box. This cycle is completed in about 10 sec, plus resin curing time. Output of such a press may reach 6000 to 7000 caps an hour with one operator tending four presses.

A committee on large plastics molding has been formed by the Society of the Plastics Industry to stimulate wider use of compression press products. This committee, citing the increased production of molded plastic television cabinets and large refrigerator parts, states that compression press operators now offer \$10 million of capital equipment to manufacturers. Induction heating of platens, a recent development in compression press design, is claimed to increase production on these presses.

Some resins in some molding applications have presented difficulties for the standard compression press. These problems were partially solved many years ago by converting the compression press into a transfer press by adding a hydraulic cylinder and heating chamber.

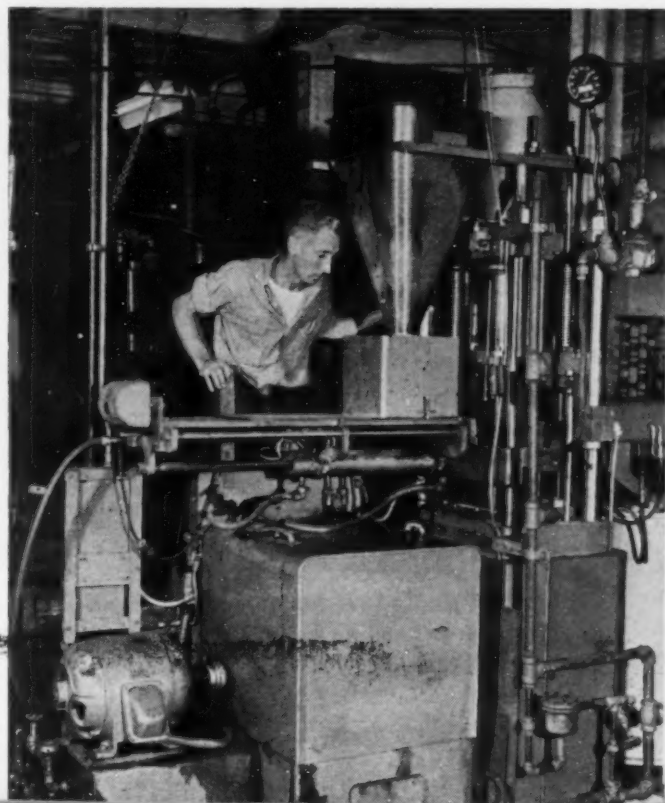
Molding powder is heated to correct plasticity before being introduced to the mold. Top or bottom ram molds are used for transfer work

more often than side rams, though some press builders place transfer cylinders directly on the lower press platen.

Speeds of both main and transfer rams are sufficiently fast to permit use of electrically heated preforms. One advantage claimed for this arrangement is ability to maintain independent pressures on both rams. This is important because temperatures as well as speed of injection are often so critical that slight pressure changes disturb the operation. Usually the transfer press may be used either as a straight compression press, loading powder preforms directly to the cavity, or as a transfer press in which the charge is first loaded into the auxiliary cylinder.

An injection molding machine consists of a hopper, cylinder with ram, heating chamber, jacketed nozzle, mold support and mold. Such a machine is the workhorse of the thermoplastics industry. Its growth in comparison with the compression press has outdistanced the growth ratio between thermoplastics and thermosetting materials. A typical 20-oz injection press, Fig. 4, weighs 31,000 lb and costs \$32,000. This particu-

FIG. 1—Moderate size compression press in production at American Insulator Co., New Freedom, Pa., can be operated on semi or fully automatic basis.



"Molding powder is frequently compacted into pills on preforming presses for ease in handling ..."

lar press has a 17-sec molding cycle with most molding materials. An upright injection press is shown in Fig. 5.

Statistics for a few injection molding machines show variations in capacities and weights. Prices of the presses vary from 65¢ to a \$1.00 or more per lb. Yearly production of plastics per lb of press weight varies from 7.2 to 19.2 lb. The approximate production values are based on cellulose acetate.

Molding powder is frequently compacted into pills on preforming presses for ease in handling and improved product. These may be single punch or rotary presses. Compared with molding presses, pressures are low and construction simple. One design features a mechanically controlled die table which moves down at half the speed of the punch, thus producing the same effect as if pressure were applied from above and below. Nearly every producer of small and medium sized thermoset moldings has one or more preform presses.

Much auxiliary equipment is needed to produce a finished plastic molding. The extent of this equipment may be judged from operations involved in making plastic dinner plates. Resin—in this case melamine formaldehyde—is mixed with a filler in stainless steel mixers.

The moist batch is dried, then ground and

mixed with other ingredients in ball mills. The next operation is preforming and then follow in order:

- (1) Preheat "pills" from preform press to 280°F in electronic heaters.
- (2) Mold four plates at a time, at 335°F on a compression press.
- (3) Remove flash on a machine which revolves plates against sanding belts.
- (4) Buff plate edges against rouged cloth wheels.
- (5) Inspect and package.

The industry spends about \$20 million a year for molds.

Plastics have a corrosive effect on many metals. The answer to this in mold design is to plate the steel molds with hard chromium or to use stainless steel. When mold cavities are made by hobbing, special hobbing steels are used. A typical hobbing alloy contains 2.1 pct C, 0.25 pct Mn, 0.25 pct Si, 12.5 pct Cr, 0.5 pct Ni.

Several types of stainless steel are available

THREADED BOTTLE CAP CYCLE

850-ton Compression Press

1. Load cavities with preforms.
2. Close mold.
3. Cure.
4. Open mold.
5. Unscrew caps.
6. Eject finished caps.
7. Clean cavities with compressed air.
8. Check to determine all cavities are empty. Ready for new cycle start.

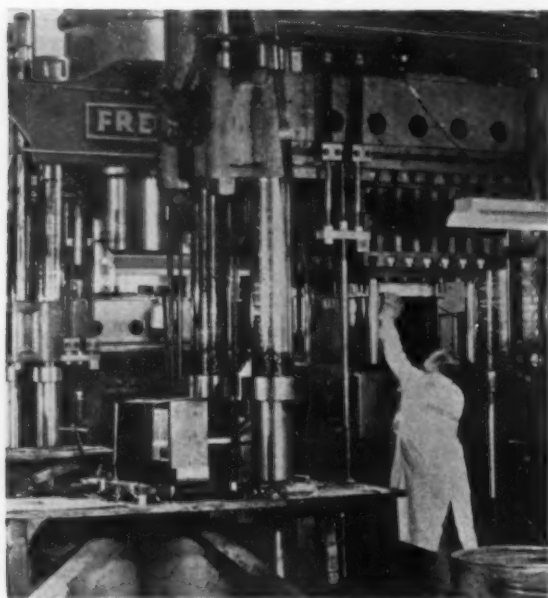


FIG. 2—Radio and TV are big users of plastics. These big presses turn out molded television cabinets.

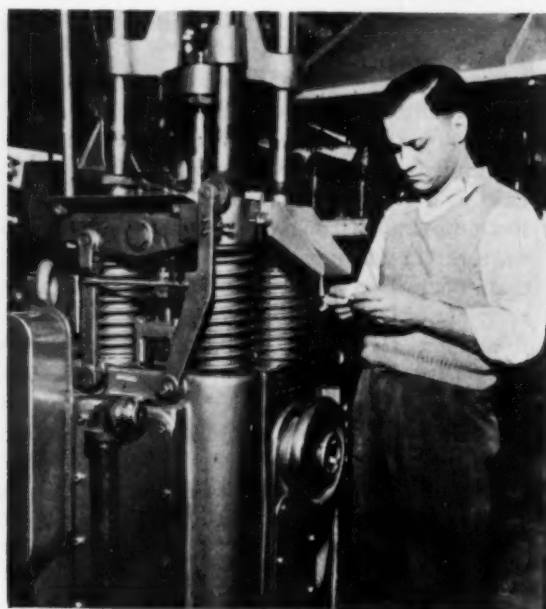


FIG. 3—Compression molding operation is simplified, quality improved by using preform press to make pellets.



FIG. 4—Core sections are removed from threaded Saran pipe fitting molded in upright injection press.



FIG. 5—Upright injection molding press. Here operator removes core section from threaded Saran pipe fitting.

to the moldmaker. Type 410 is often purchased in the form of heat-treated bars which may be machined and put directly into service. While type 420 must be used in the hardened condition for maximum resistance to the action of plastics, it is preferred by many moldmakers. For long runs calling for maximum wear resistance, type 440 stainless is used.

When plastics molders make their own molds,

a well equipped machine shop gives efficiency which the progressive plant cannot overlook. Such a shop should have among other machine tools, vertical and horizontal milling machines, duplicators, radial drills and grinders. Proper handling equipment is important. Two pieces of equipment almost indispensable in handling large die blocks are an electric hoist and an electric lift truck.

NEW BOOKS

"Practical Benchwork for Horologists," by Louis and Samuel Levin. We always hankered to take clocks apart. Had to see what made them tick. Trouble always started when we tried to put them back together. Always seemed as though there were more than enough parts to go around. If you've ever hankered to tackle a clock here's an intriguing "how to" book. It tells how to take clocks and watches apart so they can be put back together. Covers machinery and tools used in watch repair work, repair problems, watch and part design. Louis Levin & Sons. Printed by Wolfer Printing Co., 416 Wall St., Los Angeles 13. \$5.00. 381 p.

"Uranium, Plutonium and Industry," by John F. Hogerton, chairman, ASME subcommittee. The latest and best summary of the U. S. Atomic energy program. In clear, concise language it outlines production, research and application of atomic energy. Contains a brief report on weapons development, more on atomic power. There are breakdowns of major AEC projects, names of principal AEC suppliers. Well illustrated. American Society of

Mechanical Engineers, 29 West 39th St., New York 18. \$1.50. 47 p.

"Machine Shop Tooling," by Charles C. Williams. Here is the 1953 edition of Mr. Williams very helpful pocket reference book of data for machine tool operators and machinists. It's designed expressly for the man at the machine and is alphabetized for quick reference. Data contained was supplied by over 50 cooperating manufacturers of tools and materials. Wilco Press, 3326 N. Bailey St., Philadelphia 29. \$3.00. 344 p.

"Reaching Out In Management," by William B. Given, Jr. Mr. Given, chairman of the board, American Brake Shoe Co., has come up with a sequel to his book "Bottom-Up Management." Here he presents another aspect of the administrative methods—reaching out—that proved so successful in his corporation. Goal is to enable every employee in the organization to find personal fulfillment in his work. Harper & Bros., 49 E. 33rd, New York. \$2.50. 175 p.

HOW TO Tap, Mill and Broach TITANIUM

By V. L. Coughlin

Aircraft Gas Turbine Div.
General Electric Co.
Lynn, Mass.



♦ **COMMERCIALLY-PURE** titanium is comparatively soft and can be machined satisfactorily. However, its low-strength characteristics make it undesirable for most jet engine applications. Producers of titanium have therefore introduced certain alloys which contain enough strengthening elements such as chromium, iron, aluminum and manganese to develop a high-strength material. The General Electric Laboratory has found Ti-150A and RC-130B alloys the most suitable for use in machining operations.

To obtain high strength, ductile and machineable material certain property variations of these alloys must be controlled. Surface imperfection is an important factor. Titanium alloys having low-impact energy to fracture are particularly sensitive to grinding scratches, small-machined radii, tungsten inclusions, pits from sandblasting or residual stresses.

Another factor affecting titanium property values is the so-called "cold-working" of the metal below its critical temperature. Working of titanium below 1300°F tends to lower ductility while increasing the strength. To assure maximum ductility, most titanium is annealed before use. Cold-work effects and internal stresses can be removed by heating from 1100° to 1300°F for a short period and cooling slowly.

Water quenching of titanium alloys will harden the surface about ten points Rc but is too shallow to contribute to the wear resistance or strength of the part.

One of the main problems in machining titan-

ium is its tendency to gall or weld itself to the tool. Work hardenability is another troublesome factor especially if the work is allowed to revolve against the tool when not cutting. The metal also has a particular abrasiveness in the alloys, which causes tool wear.

Tapping has proved to be the most difficult machining operation. In tapping, effort is concentrated on the obtaining of an accurate size hole with long tap life at reasonable cost. Major problems encountered in tapping include: A galling or seizing action on the tap, or a tendency of the metal to build up on the cutting edge, thereby interfering with the cutting action; A shrinking action of the tapped hole at completion of cut; Breakage of taps due to tremendous pressures brought to bear when cutting drilled holes with slight variations in diameter.

Numerous tests on radial drills, upright drills, and lead-screw tappers indicate that a skip-tooth, three-flute tap is the most desirable. Three basic tap designs which have proved successful in these tests are shown in Fig. 1.

A four-fluted tap, Fig. 1A, has produced over 150 class three-tapped holes with 75 pct thread without resharpening. Size was excellent. A two-fluted tap, Fig. 1B, has produced 75 tapped holes without resharpening. To decrease the pressure on the tool, the top of the threads have been flattened to provide less surface contact with the work.

Fig. 1C is the three-fluted tap. To decrease pressure on the tool, allow for freer cutting,

- ◆ For better machinability property variations of titanium alloys must be controlled . . . One of the main problems is a tendency to galling . . . Work hardenability is a troublesome factor.
- ◆ Tapping is the most difficult machining operation . . . In milling, high-speed tools are preferable . . . Broaching requirements demand consistent accuracy.

longer tool life and increased accuracy, every other tooth has been removed. This type of tap has produced 200 odd holes with good size. It is still capable of producing, although it would be more economical to resharpen it for longer overall life and accuracy.

The coupling shown in Fig. 2 is typical of the work tapped, the rigidity of setup required, and the type of machine used. A lead-screw tapper is used.

Part requirements include a 75 pct thread, class three-tapped hole and a full thread $\frac{3}{4}$ deep.

Cutting speed on this part is approximately 20 sfpm using surface-treated, high-speed steel tools and a heavy sulfur-based oil.

Use power tapping where possible

To tap titanium successfully several factors should be kept in mind: Power tapping should be used whenever possible for greater accuracy and reduced tap breakage. Rigid setups are a must; holes drilled with dull drills will cause tap breakage; to facilitate cutting, thread requirements should be reduced to 60 to 70 pct if possible; optimum thread engagement is $1\frac{1}{2}$ times tap diameter. Greater thread engagement does not increase the strength of the part.

Milling titanium presents the problem of retaining sharp cutters, preventing buildup on tools, and eliminating work hardenability. Experience has shown that heavy cuts, low speeds and coarse feeds are a must and that as rugged a machine as possible with ample horsepower to take the load should be used. High-speed steel tools particularly 18-4-2 are the most desirable as tungsten carbide has not proved sufficiently tough to withstand the intermittent cuts combined with high pressures.

Fig. 3 shows the tool geometry for milling cutters which are being used for milling titanium. The 45° chamfer for cutter corners helps dissipate the heat and retain the cutter edge. Slab-milling blanks for titanium lugs using a high-speed steel cutter is shown in Fig. 4.

In titanium milling tests, it was found that climb cutting was most effective and that power feeds retain longer cutter life. It is desirable to face mill whenever practical. To prevent tool flaking and chipping a tool must be retracted from

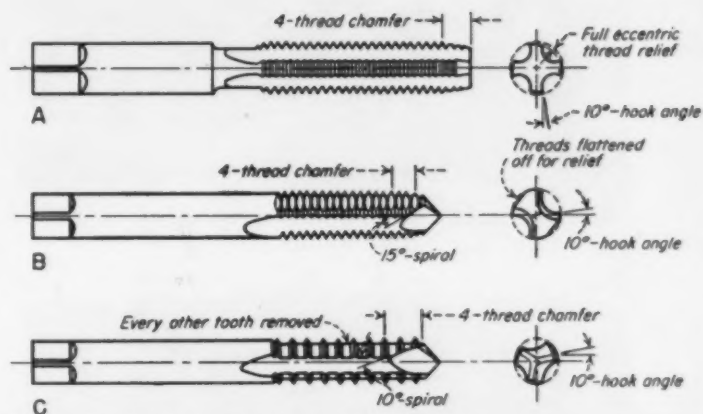


FIG. 1—Three basic tap designs used with titanium.

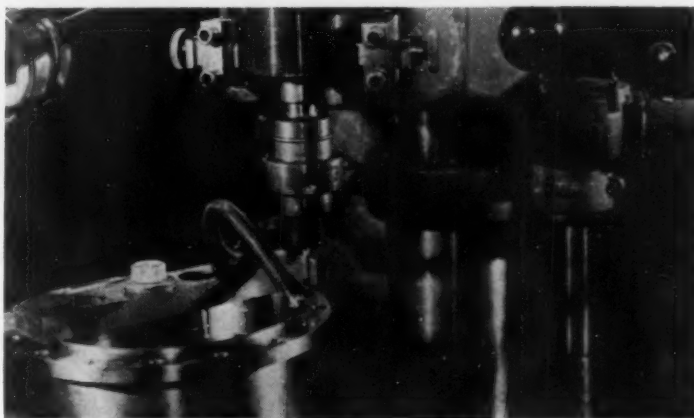
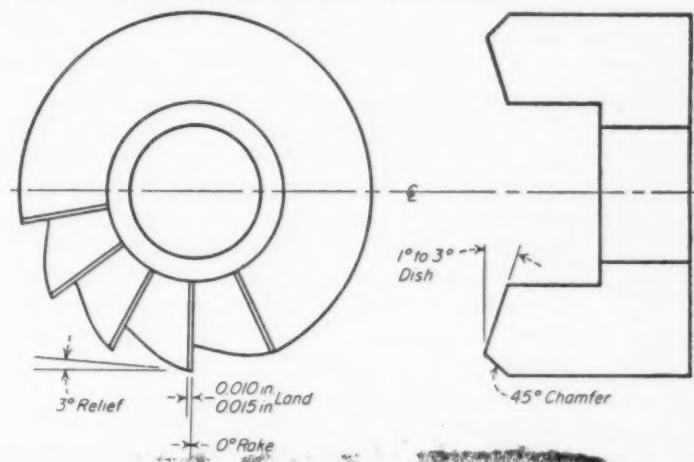


FIG. 2—Coupling shows typical work tapped, rigidity of setup required and machine used.

FIG. 3—Tool geometry of mill cutters for titanium use.



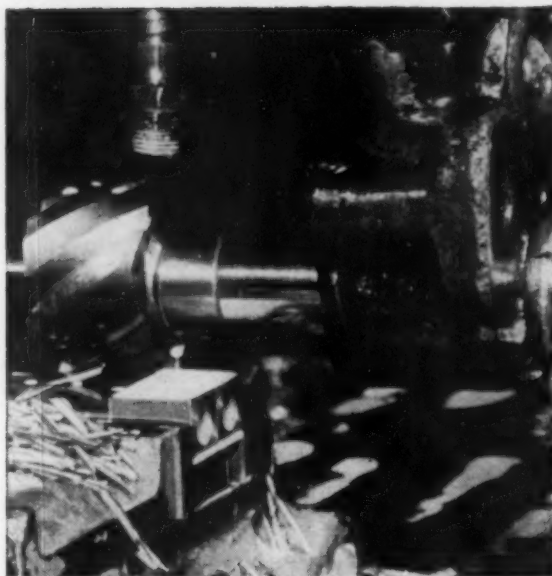


FIG. 4—Slab milling blanks for titanium lugs. A high-speed steel cutter is recommended.

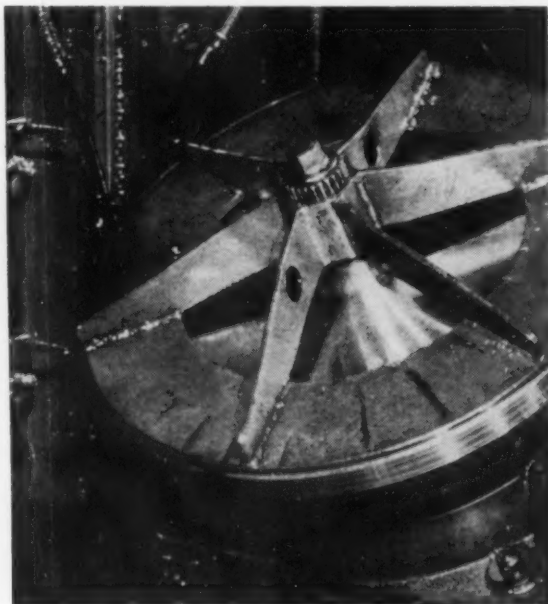


FIG. 5—In broaching this titanium wheel about 150 slots per grind are obtained before resharpening.

the workpieces when the cut is finished.

For longer tool life and accuracy rigid setups are required.

GE broaching requirements demand consistent accuracy and a maximum of 16 microinch finish on parts. Titanium with high Rockwell hardness tends to bind and resist cuts of this nature. Therefore, material with a maximum hardness of 37 Rc is necessary. Broaches requiring one pass are used with corresponding rigid setups for the tool and work.

In broaching the titanium wheel, shown in Fig. 5, about 150 slots per grind are obtained.

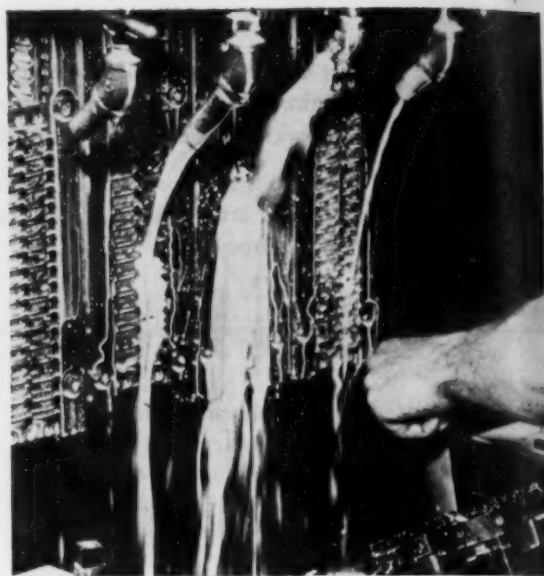


FIG. 6—Example of angle and dovetail broaching. Pieces per grind are about 800.

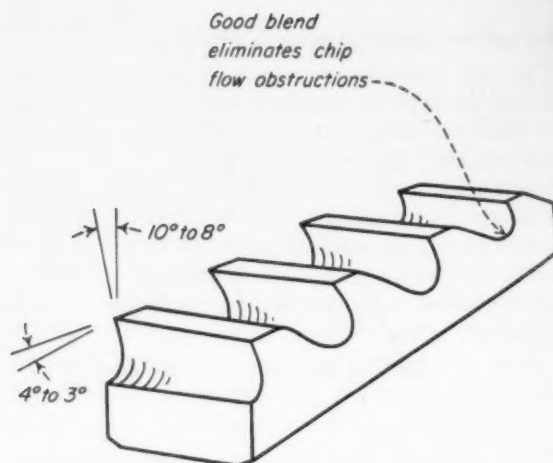
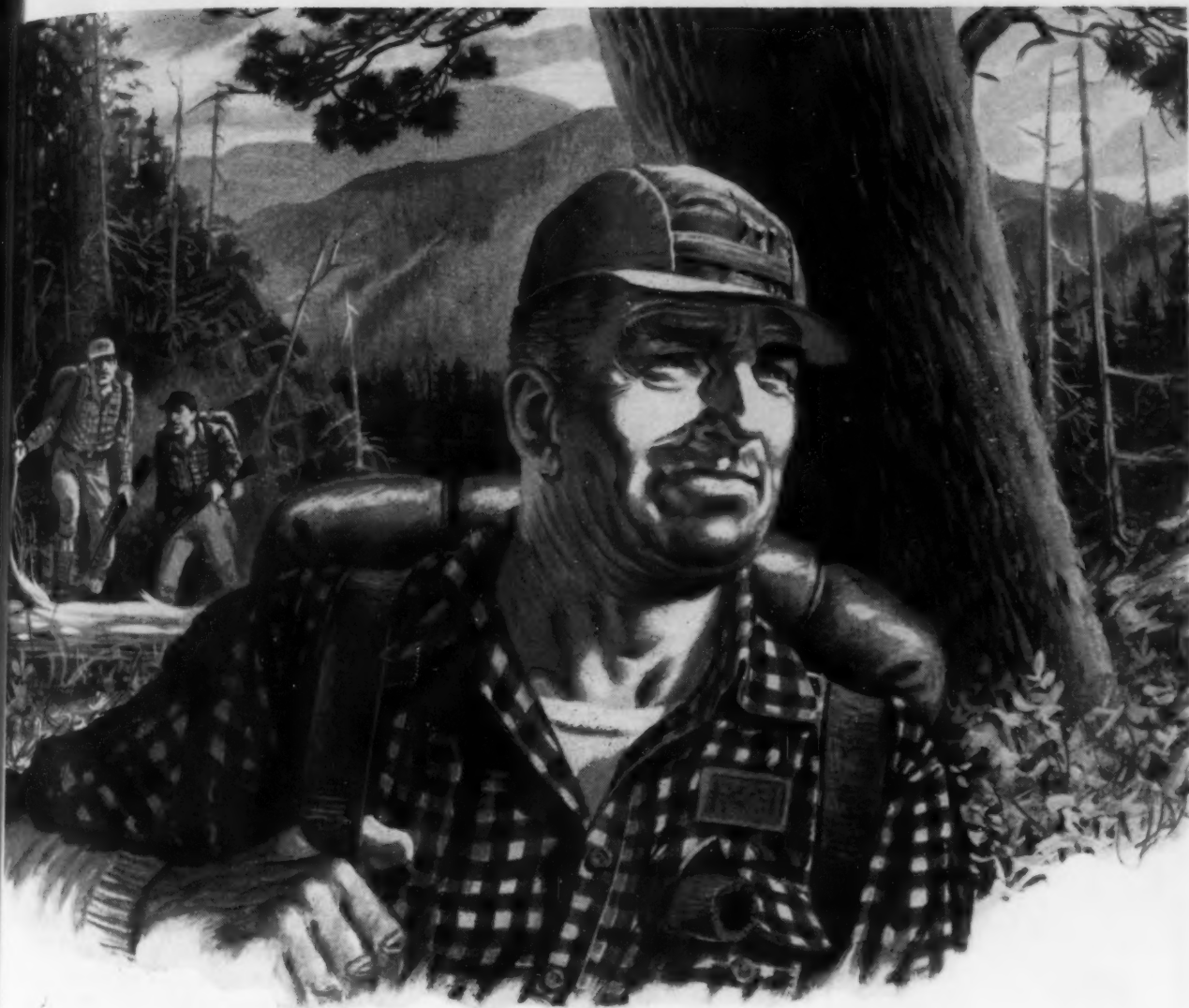


FIG. 7—Tool geometry of typical broach for titanium. Broaches are wet ground and superfinished.

At this time the tool is resharpened regardless of the appearance of the broach. This was found to be the number of cuts at which minimum breakdowns occurred.

Both dovetail and angle broaching are used in titanium broaching, see Fig. 6. Pieces per grind are in the neighborhood of 800 pieces. A 16-in. microfinish is required with no tears. No forgings over 37 Rc are broached. The tool geometry of a typical broach for these operations is shown in Fig. 7. Since the grinding of these broaches is critical, they are wet ground and the cutting surfaces superfinished.



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Technical Briefs

Engineering

PLANT HEATING:

Multi-furnace installation solves unusual heating problem.

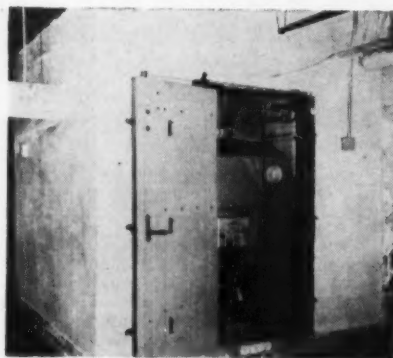
Installation of 29 individual furnaces in place of the old central heating system helped solve an unusual heating problem in an old building at Middletown, Ohio.

Use of separate furnaces permitted rental of a previously unwanted building for both manufacturing and warehousing. Aeronca Mfg. Co. and the U. S. Rubber Co. are new tenants.

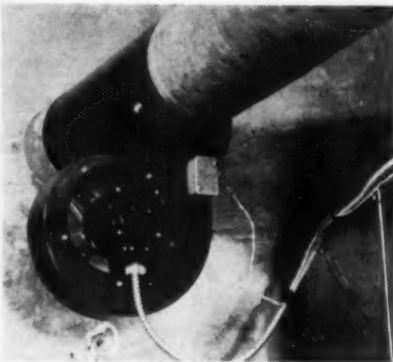
The five-story plant once owned by a tobacco company could not be rented because it could not be properly heated with the old central steam plant consisting of two 480 hp coal boilers.

High Operating Costs

Extra large steam pipes ran through some parts of the building. In other areas there were



TWENTY-NINE FURNACES in individual furnace rooms solved the heating problem in a Middletown, Ohio, building. Formerly used as a tobacco plant, the building is now used by Aeronca Mfg. Co. and U. S. Rubber Co.



BUILDING COMMISSIONER gave okay to plans for separate furnace installations if draft creators such as these Quickdraft units were used for venting.

IF YOU WANT MORE DATA

You may secure additional information on any item briefed in this section by using the reply card on page 143. Just indicate the subject heading and the page on which it appears. Be sure to note exactly the information wanted.

no radiators. Thus, it was difficult to keep some areas above freezing, while others were registering a sweltering 80°F., and more.

Cost of replacing the old central steam plant exceeded the cost of the building. Even the cost of revamping was prohibitive. To operate the old plant cost \$60,000 a year for fuel and personnel.

Venting Problem

Managers of the building decided to install 29 separate furnaces throughout the building to maintain temperatures of 72°F in manufacturing areas and 55°F in storage areas. Toughest problem was how to vent the furnaces. The Ohio code calls for costly masonry chimneys. A Middletown ordinance permitted insulated steel chimneys, but there was no assurance they would provide the draft needed.

Quickdraft Co. was called to see if their draft creator would provide sufficient draft to vent the furnaces out the side of the building. Upon receiving assurance that Quickdraft would vent the furnaces horizontally with sufficient draft to dispose of the products of combustion when the furnaces were fired to capacity, the layout and specifications were completed.

Plans Accepted

Plans were okayed by the building commissioner of Middletown with a recommendation for venting the 29 furnaces horizontally out the side of the building under induced draft. This was accepted as the equivalent of a masonry

chimney when the induced draft was established before the furnace fire came on.

Establishment of full draft before the fire comes on was accomplished by starting the blowers with the room thermostat and adding a sail switch to the blower to control the fire.

Build Heater Rooms

Heater-rooms with fire-resistive doors were built for each furnace. Twenty-nine steel arch-top oil furnaces with three radiators each were selected to heat the building.

High-pressure, gun-type Far-Quar oil-burners with line voltage thermostats and with standard limit and primary controls are used.

Based on fuel oil costing $10\frac{1}{2}\epsilon$ per gal, the indications are that fuel costs for an entire winter season will be well below \$10,000. Cost of the new installation will be offset in less than 2 years by annual savings of \$40,000 in fuel and personnel costs.

METAL CONGRESS:

Western show draws many exhibitors . . . Will have film theater.

High temperature alloys and service will be the theme of the program to be presented by American Institute of Mining & Metallurgical Engineers—Metals Branch, as a feature of the Western Metal Congress in Los Angeles.

Industrial Theater

The congress will run Mar. 23 to 27 in the Hotel Statler and the Western Metal Exposition will hold forth on the same dates in Pan-Pacific auditorium. The AIME program will be given on the afternoon of Mar. 26.

More than 271 firms have entered exhibits. Better production at lower cost will be the show theme. An industrial theater will be set up to show films depicting recent developments in machining, metal fabricating methods, and testing.

Turn Page

March 5, 1953

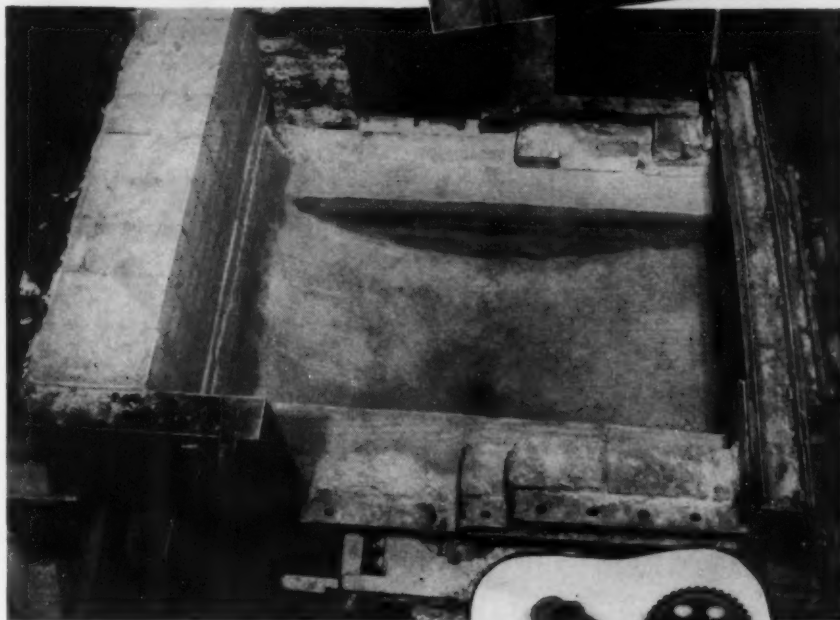
FRANTZ MFG. CO.

USES

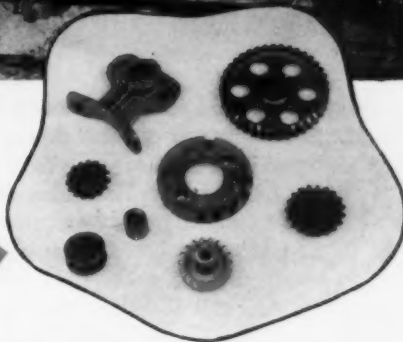
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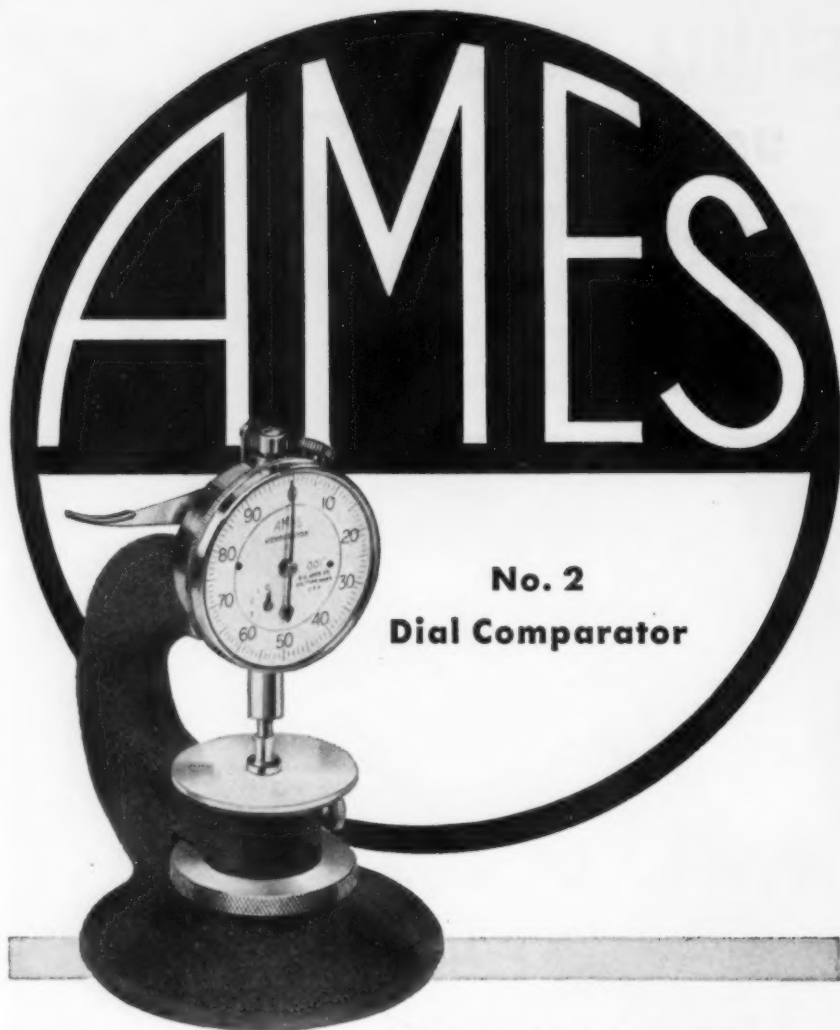


To produce the metal for their intricate washing machine parts castings, Frantz Mfg. Co., of Canton, Ohio uses a 1000 lb. Sklenar furnace. Gray iron is tapped at 2700° after a heat of 1 hour. Previous to using Shamva cement, Frantz was getting 53 heats with fireclay brick. After switching to Shamva cement, furnace life was increased to 203 heats, and this number has been repeated over and over for several years.

Shamva Mullite Cements, Brick and Shapes have been giving similar outstanding performances consistently. Perhaps you can profit from the Mullite story. Our field engineers will be glad to tell you about it.

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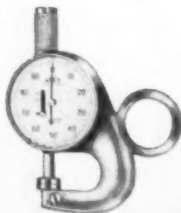
This is smallest in the Ames' line of high quality dial comparators and it is ideal for desk or bench use in the fine inspection of small precision parts. It is light in weight, but its broad base makes it very stable. The capacity approximates that of the regularly supplied Ames No. 202 Dial Indicator which has a dial numbered 0-100, graduated in .001" and with a .250" range.

Should your job requirements differ, you can have the No. 2 with any Ames "Hundred Series" Dial Indicator. Send for Ames Catalog No. 58 covering the entire line of Ames

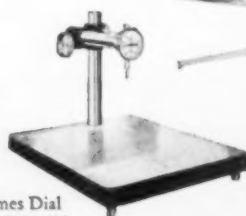
Top Quality measuring instruments or, better still, send complete details of your Quality Control problem. Ames will suggest a solution — no obligation, of course.



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—Technical Briefs—

HOUSING:

Aluminum house and components easily assembled on site.

Demand for a low-priced dwelling that is fireproof, corrosion-resistant and can take the punishment of tropical climates, is being met by an all-aluminum house, particularly in areas of South America.

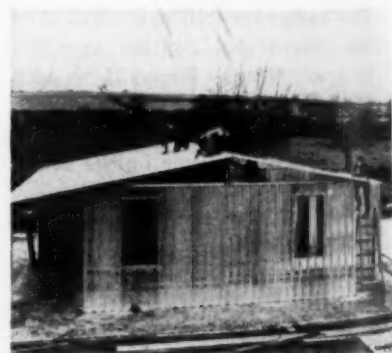
The structure, known as the Kingstrand House, weighs from 865 lb for the simplest two-room dwelling to 2300 lb for an eight-room house with two verandas. Packing case specifications for shipment range from 27 to 39 cu ft.

The unit, developed by Aluminum Laboratories, Kingston, Ontario, is simple to erect. Neither technical nor skilled labor is required.

Stiffened and Braced

Walls and roof consist of deeply troughed aluminum sheets. Where the sheets overlap, they are bolted together. Wall and roof sheets are secured by means of angles. Doors and shutters are assembled on site, using sheets of the same profile as the wall and roof sheets stiffened and braced by top hat sections.

While shortage of aluminum severely restricted the supply of houses, 3000 were sold in 2 years, 600 of the units for use in Karachi, Pakistan. Tests have actually shown that the temperature inside an aluminum house exposed to tropical sunshine can be lower than outside shade temperature.



THREE THOUSAND of these Canadian-built aluminum houses have been sold in the past 2 years. Units are easily assembled on location.

SUPERSONIC FLIGHT:

Jet speeds to 20,000 mph seen for future.

Jet plane speeds of 20,000 mph—fifteen times as fast as the earth rotates—are possible within the foreseeable future, Prof. Frederick K. Teichmann, head of New York University's Guggenheim School of Aeronautics, recently declared in an address on "The Future of Jet Propulsion" at The Cooper Union, New York.

Prof. Teichmann based his prediction on the expectation that jet engines of 500,000 lb thrust and equal to 125 times the power of today's aircraft piston engines will be developed in the near future.

Mind Too Slow

Speeds have become so great that the human mind can no longer react with enough speed to make the decisions required in a split second. There is, therefore, a need for automatic controls and operation.

Guidance systems, containing electronic devices are capable of "thinking" at a rate 10,000 times the speed of the human brain.

Robot Planes

With a human cargo in such a high speed airplane, there must be pressurization, refrigeration as well as a careful study of all human needs during extended flights at high altitudes.

Developments are presently under way in new types of protective clothing that should take care of temperature, acceleration and pressure problems.

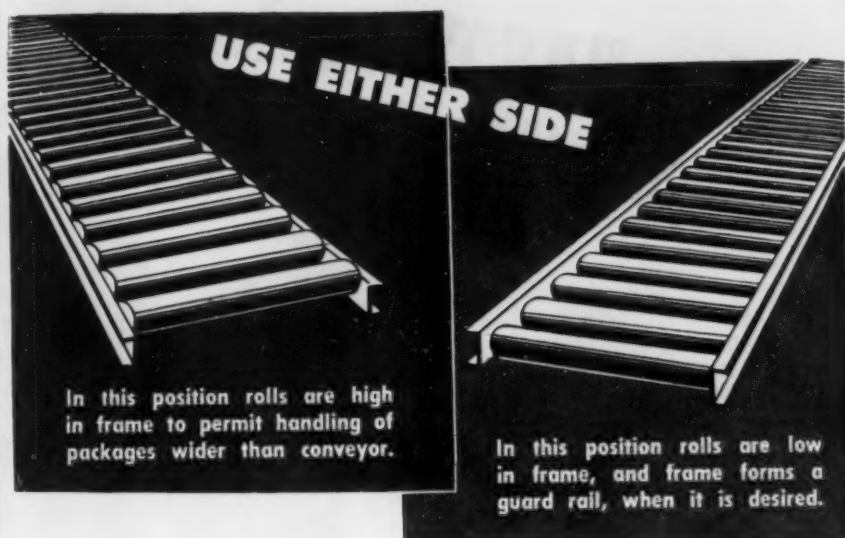
Toughest Barrier

The fully automatic airplane of the future may carry no humans at all. Fully automatic airplanes may soon fly our mail and transport cargo across the continent and the world.

More research is needed on fuels, on high-temperature resistant metals or more effective methods of cooling the inner walls of rocket engines, and the outer skins of high speed airframes.

Toughest technical problem on

Turn Page



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Shown above is one of the features of Logan Stock Roller Conveyor. Other features include (a) immediate shipment (b) available in several sizes (c) both straight and curved sections can be furnished (d) both stationary and portable supports available.

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ROLLER—2 1/4" O.D. No. 16 Ga. Welded Steel Tubing.

Pressed Steel cup secured to tubing. Cap. 150 lbs.

SHAFT—7/16" Hexagon Cold Rolled Steel. Positively

locked against rotation by hexagon holes in frame.

BEARING—No. 50. Slip fit in cup, easily removed and replaced. Protected position—set back from end of roll.

FRAME—3 1/2" x 1 1/4" x 10 Ga. Pressed Steel Channel.

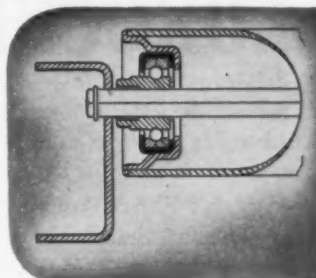
With four 1-5/16" O.D. 13 Ga. Welded Tubing

ties per 10'-0" section. Capacity 75 lbs. per foot

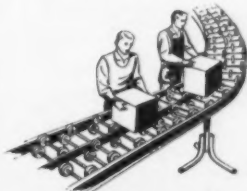
with supports on 10'-0" centers and 380 lbs. per

foot with supports on 5'-0" centers.

COUPLING—Furnished with bolted type for stationary service. Can furnish hook type for portable service if preferred.



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make **FAST** work
of the **BIG** tie-ups!



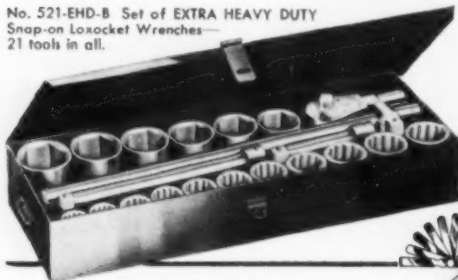
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The full Standard Set of these powerful tools, pictured below, will give your crew the *right* equipment to break loose those big, rusted-on nuts and bolts, or to tighten them up to the limit... with no time-wasting makeshifts. There are many more shop-proved Snap-on tools that will save money in your plant—more than 4,000 to meet the widest range of needs. Snap-on gives you close-at-hand

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service through factory branch warehouses in principal industrial centers. Write for the Snap-on Special Industrial Catalog and 104-page General Catalog.

Technical Briefs

the immediate supersonic schedule is not the sonic barrier but the "thermal barrier."

Air friction at speeds of 1300 mph at 40,000 ft. produce temperatures of more than 200°F on the airplanes' inner and outer surfaces, well above the boiling point of water at that altitude.

Either new temperature resistant metals and ceramics, or methods of cooling will be necessary. The titanium alloys and certain types of metal sandwich construction offer great possibilities.

DIE STORAGE:

Pittsburgh Forging saves to 75 pct of floor space.

A die storing system developed by Pittsburgh Forgings Co. of Coraopolis, Pa., conserves floor space and makes die handling easier and more efficient.

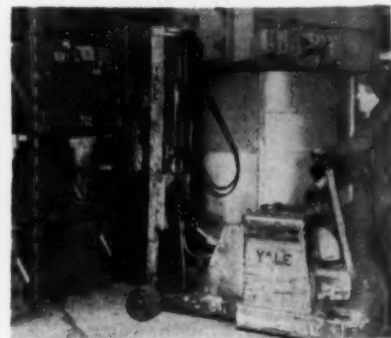
Under the old handling and storing system, dies were stacked two high with each pair resting directly on the pair beneath it. Each pair of dies was handled by a sling chain from an overhead, short-span chain hoist equipped crane.

Dies, though placed as closely to each other as possible, consumed a storage area of over 6400 sq ft.

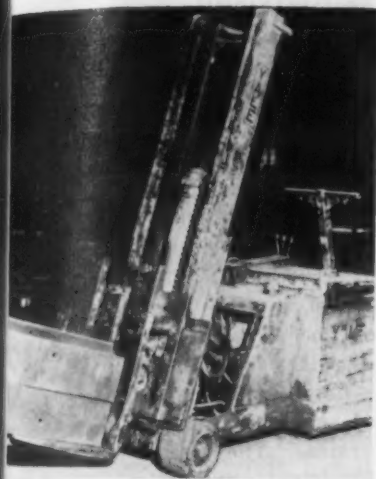
Storage Problems

Also it was difficult to keep track of the dies and sometimes as many as four or five stacks had to be moved to get at the die that was required for a specific operation.

All die storage was out of doors which meant that the dies had to



SIDE-SHIFTER on Yale fork truck easily moves dies sideways for flush right storage in new setup at Pittsburgh Forgings Co.



ADJUSTABLE FORKS on lift truck slide easily into dovetail and make it possible to move dies without palletization.

be thoroughly greased. At times during the winter many dies were locked together by ice which increased the difficulty of efficient handling.

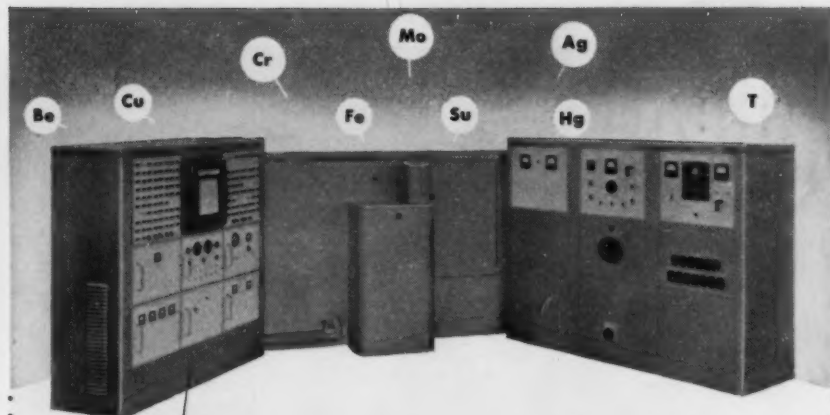
With the new storage system fork lift trucks play a major role. Dies are stacked in specially designed racks which are placed on both sides of the aisle in a saw tooth arrangement. This saw tooth 45° angle stacking arrangement allows the Yale Worksaver trucks to operate in a minimum width aisle and facilitates the handling of dies into and out of storage.

Dies Fork Handled

The dies being handled are matched, male and female, and dovetailed to index on the anvil and on the ram of the hammer. This dovetail permits the lift truck with its adjustable forks to pick up each pair of dies and transport the units in and out of storage without palletization. Individual loads run as high as 3260 lb.

A side shifting attachment on the fork trucks helps conserve space and time by making it possible for the operator to shift his load either right or left without jockeying his truck. This side shifting feature also allows the operator to work with a much smaller turning radius and permits flush right and flush left stacking which further conserves the space necessary for storage.

Turn Page



Element Determinations are 2300% FASTER

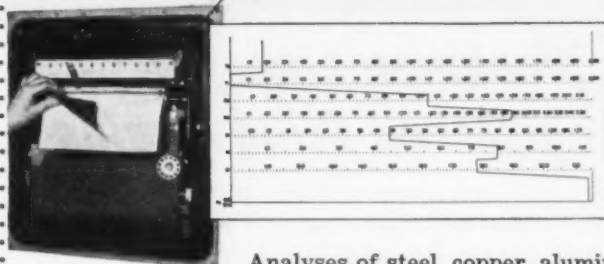
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Truly, the ARL Production Control Quantometer CAN SAVE YOU MONEY in so many ways in your manufacturing processes that it deserves your most earnest consideration.

*Trade Mark

**Names furnished on request

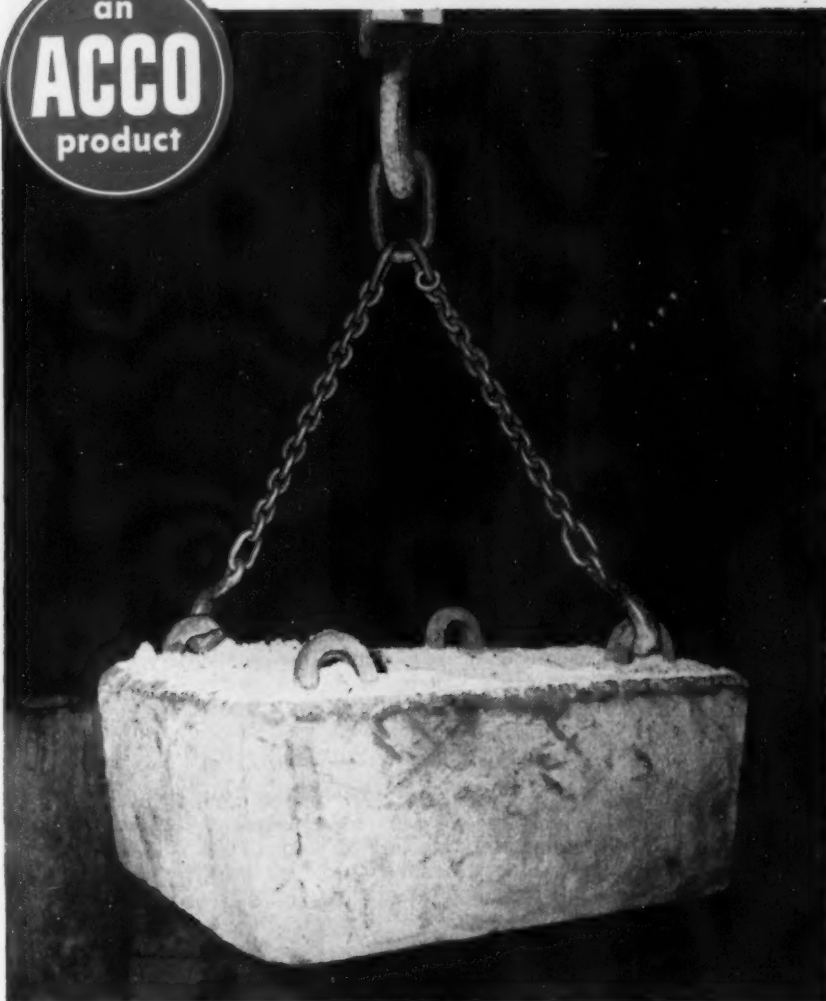
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—Technical Briefs—

ORIENTATION:

NBS uses polarized light to study grain orientation in alloys.

Polarized light is being used by scientists of the National Bureau of Standards to help determine grain orientation of small crystals found in commercial alloys. Studies of a 70 pct Ni, 30 pct Cu alloy, Monel, indicate crystal orientation can be correlated with extinctions of polarized light.

Commercial metals are composed of aggregates of small crystals or grains. The magnitude of many important properties — such as strength, elasticity, and magnetism — differs in different directions in these small crystals.

Random v. Preferred

In some metals, orientations of the individual crystals do not follow a random distribution. Instead, a "preferred orientation" predominates. Overall properties of the metal vary with direction. Also, orientations of adjacent crystals influence their interactions when the aggregate is subjected to strain, heat, or corrosive environment.

X-ray diffraction methods of determining crystal orientation have been attempted, but cannot be applied conveniently to small crystals. The metallurgical microscope is convenient for observing small crystals, but its use is generally limited to showing differences in orientation qualitatively.

Polarized Light

In recent years, these microscopes have been equipped so that the specimen can be illuminated with plane-polarized light. When a metallographically polished and optically active surface is examined with such an arrangement, characteristics of reflected polarized light change measurably from crystal to crystal.

In the commercial metallographic microscope used for the NBS study, the analyzer is fixed in the crossed position with respect to the polarizer, and the light irradiates the polished surface of the specimen. Under these conditions, when an optically anisotropic surface is ro-

ated 360° around the axis of the incident beam, four minima (extinctions) and four maxima will alternately appear in the intensity of the reflected light.

Etching Helps

Although metals having a cubic crystal structure are not inherently optically anisotropic, the surfaces of many such metals—including Monel—become optically anisotropic after etching with conventional metallographic reagents.

The angular positions of the polarized-light extinctions of Monel differ for adjacent crystals, and it was found that these positions remained the same after repolishing and re-etching. It seemed to follow that the apparent optical anisotropy, being thus independent of the etching treatment, could probably be correlated with crystal orientation.

Examination of annealed Monel specimens showed clusters of crystals in which each crystal was adjacent to at least one annealing twin. Some of the clusters contained a crystal whose straight-line boundaries were in four different directions. This made it possible to determine the orientation of that crystal from geometry and a knowledge of the angular relationships of the twinning planes and the coordinate axes of the crystal.

In the Monel crystal, the twinning planes and coordinate axes are the four octahedral planes and the three cubic axes respectively. After determination of the orientation of one crystal it was possible to determine the orientations of the twinned crystals. The orientations of 12 crystals were determined and their extinction positions measured.

New Casting Machine Developed

Clamping pressure of 650 tons is developed by an unusual method of clamping used on a new die forge casting machine recently developed by Lewis Welding & Engineering Corp., Bedford, Ohio. The high clamping pressure is necessary to resist high injection pressures.

Turn Page

March 5, 1953



How ACCO REGISTERED Stock Slings Save You Money—with Safety

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—Technical Briefs—

Continued

BIGGER BRAINS:

Electronic computer can make 100 calculations per second.

A new electronic computer with one of the largest "memories" yet incorporated in any computing device has recently been completed for the U. S. Air Force by General Electric Co.

The brain of the computer is a metallic drum which can hold pulses representing 10,000 ten-decimal numbers on its magnetized surface until the numbers are called into use.

Solves Problems Faster

The new digital computer, "OARAC" (for Office of Air Research Automatic Computer), can deliver rapid-fire answers in type-written form to mathematical puzzles which would take expert mathematicians years to solve. It can make as many as 100 calculations per second.

The new computer will be used by Air Force in solving complex problems involving aircraft design, guided missiles and ballistics.

OARAC will save valuable research and development time, equipment and money by eliminating much costly flight testing of experimental aircraft equipment. For example, OARAC will decrease the flight test time required in developing auto-pilots.

Typical Problem

One typical problem that has been used to test the computer here is so complex that 212 8-by-10 inch pages of numbers are needed just to state the problem. In solving it, so many millions of operations are involved that without the aid of a computer it would probably never be solved.

On a less complex level, if you multiply two ten-digit numbers together, it may take you 10 min working in longhand to get an answer of several billion billions, and it won't necessarily be right. The OARAC will calculate the right answer in about four one-thousandths of a second.

INDUSTRIAL X-RAY:

Portable unit permits more complete weld inspection on ships.

Welding flaws on ships' high pressure steam lines, at certain hull stress points, and on submarine pressure hulls, will become less of a hazard to personnel as a result of new industrial x-ray techniques now available to the shipbuilding industry.

The U. S. Navy, to insure pressure hull welds strong enough to withstand the tremendous strain of depth charges, demands that all such welding jobs be checked 100 per cent before these craft go to sea.

Use Industrial X-ray Unit

At three of Uncle Sam's naval shipyards the intricate job of locating minute imperfections in "confined" areas of a ship's structure has been simplified through the use of a new industrial x-ray unit developed by the General Electric Co.

The new unit does in 3½ min what used to take 4 hrs with heavier equipment or radium pills, according to J. R. Jones, head radiographer at the San Francisco Naval Shipyard.

Less Than 150 Lb

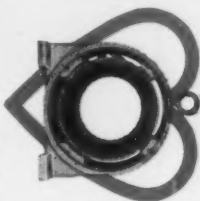
Since the x-ray head of this midget-type machine weighs less than 150 lb as against 1150 lb for



MAKING A LANDING on a U. S. Navy sub at the San Francisco Naval Shipyard is GE's new industrial X-ray unit.

Turn Page

The WINDING is the
1. *Extra insulation* in stator slots and between phases.
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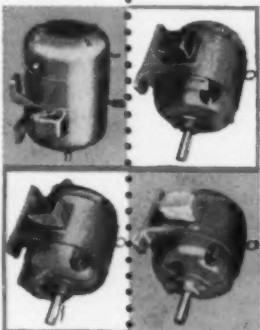
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— Homer Foundry Corp.



Many well managed plants, like Homer Foundry Corporation at Coldwater, Michigan, have greatly reduced the cost of supplying gloves to workmen by standardizing on modern fabric gloves with tough natural rubber or NEOX coated palms. Workmen find these cloth-backed gloves more comfortable than "dipped" gloves and more suitable for hot castings than plastic gloves which tend to melt with heat.



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Technical Briefs



SMALL SIZE and portability of industrial X-ray unit simplifies taking of inside-out pictures of sub hull welds.

conventional units, it can be carried to the welded structure instead of moving the structure to the x-ray machine.

Its small size and portability also make possible the taking of "inside out" pictures, since the head of the unit can be placed in the structure to be x-rayed.

At the San Francisco Naval Shipyard, where the unit is the only one of its kind in the West, and one of three in the nation, the portable machine is mounted on a small trailer when it is moved throughout the shop and waterfront areas. To get the unit inside of any ship requiring x-ray inspection, it is hoisted by traveling dockside cranes.

Inspect Castings, Valves

The unit is also used at the yard to inspect castings, such as valves, and high pressure piping, allowing greater economy in the utilization of laboratory manpower.

In setting up the unit for the inspection of a welded joint connecting two sections of a pipe, the x-ray unit can be brought inside the ship hull. Position for each exposure area can be changed without disturbing the pipe.

The unit can also be used inside large castings and other areas difficult to reach, or the snout of the machine can be inserted inside a smaller casting.

FOUNDry:

Gisholt tries new setup for cleaning machine tool castings.

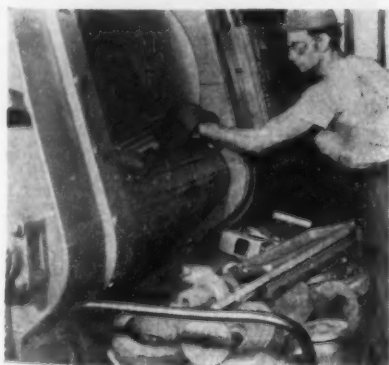
A higher quality of cleaned castings is produced in less time at Gisholt Machine Co., Madison, Wis., using a new type cleaning unit. Improved plant housekeeping and substantially reduced labor costs, power costs and floor space requirements have also been reported.

The company formerly cleaned its castings in three tumbling mills. Now, one 12 cu ft capacity airless Rotoblast barrel does the job more effectively and at lower cost. It is being operated through two 8-hr shifts per day and is averaging 10 loads per hour. Each load carries from 1000 to 1500 lb of gray iron castings—depending upon the type and size. This makes an average total of 12,500 lb per hour.

Labor Costs

Labor costs were immediately reduced 33 1/3 pct with the installation of this machine. The tumbling operation required three workers; the blast cleaning only two.

Gisholt's quality requirements are very high. It is their aim to produce painted finishes on their machine tools equal to those on automotive bodies. The Blastmaster barrel meets these quality requirements by providing a better finish than was obtainable by tumbling. In addition, the cleaning method used causes no break-

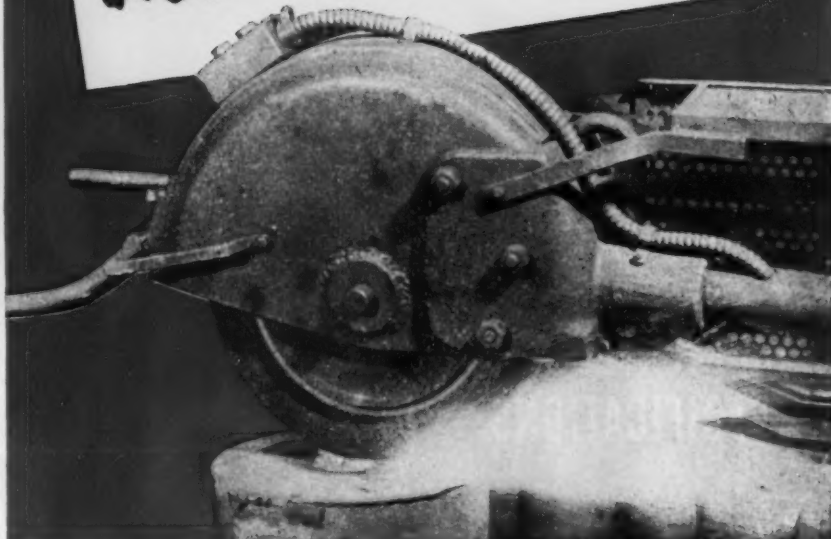


DESIGN of work carrying slats in airless Rotoblast prevents parts from being pinched, keeps wire or chill nails out of chain drive. Castings cleaned range from 1/2 to 125 lb.

Turn Page

March 5, 1953

MORE METAL BITE!



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The metal bite of Electro Specific Purpose Grinding Wheels runs high. Competitive tests have proved it. We can't supply you with wheels that will be increasingly efficient on all operations under any condition, but we know that we can supply you with either standard speed vitrified, or high speed resinoid wheels that will increase both the quality and quantity of your output, and save you money while doing it. May we, without cost or obligation, send a technical expert to tell and show you why and how? Wire, phone or write.



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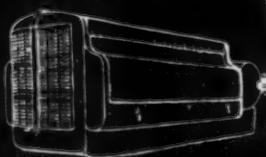
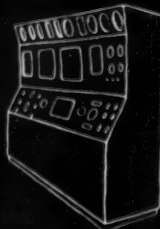
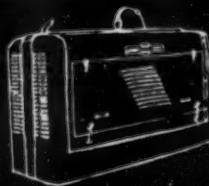
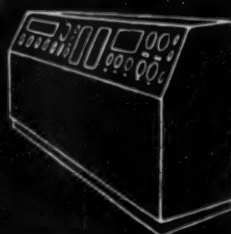
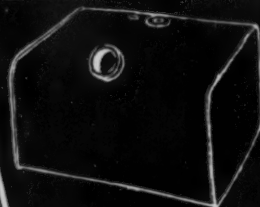
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Technical Briefs

down of the sharp corners and edges of the castings.

Power Requirements

Operating costs of the barrel are substantially lower than the three tumbling mills. Power requirements are lower because the barrel requires less horsepower to operate—23 hp as compared with 54 hp for the three tumbling mills. This represents a 57 per cent reduction in electrical power consumption. Another saving results from the fact that the new barrel operates only a fraction of the time required to clean the same amount of castings in the tumbling mill.

The saving in floor space has also been appreciable. An area amounting to 210 sq ft, required for the three tumbling mills, can now be released for other use.

The machine cleans a wide range of gray iron castings used in the manufacture of the company's line of machine tools—turret lathes, automatic chucking machines, precision balancing machines, etc. These castings range in size from 1/2 lb to 125 lb each.



CABLE-ACTUATED loader as seen from side. Loader is push-button controlled.

SAE Revises Lubricant Data

Two new developments with regard to lubricants will appear in the 1953 edition of the Society of Automotive Engineers Handbook. Revised copy for SAE General Information Report on Crankcase Oil Types will be based on the new American Petroleum Institute service classification system.

BEARINGS:

Fingerprint contamination can be eliminated.

Under normal storage conditions, the primary factor in preservation of ball and roller bearings is their cleanliness. J. H. Gustafson recently told the Joint Industry Preservation and Packaging Conference that includes not only freedom from dirt but also freedom from surface moisture and fingerprint residues. If bearings are clean, thin films of rust preventive and non-corrosive paper will adequately protect the bearings for several years storage.

Fingerprint contamination, however, causes most corrosion of finished bearings. These residues are often overlooked because in many cases rusting and staining have not yet developed when bearings are shipped. Oil and grease coatings will prevent, or retard, rusting on these areas merely by keeping moisture out.

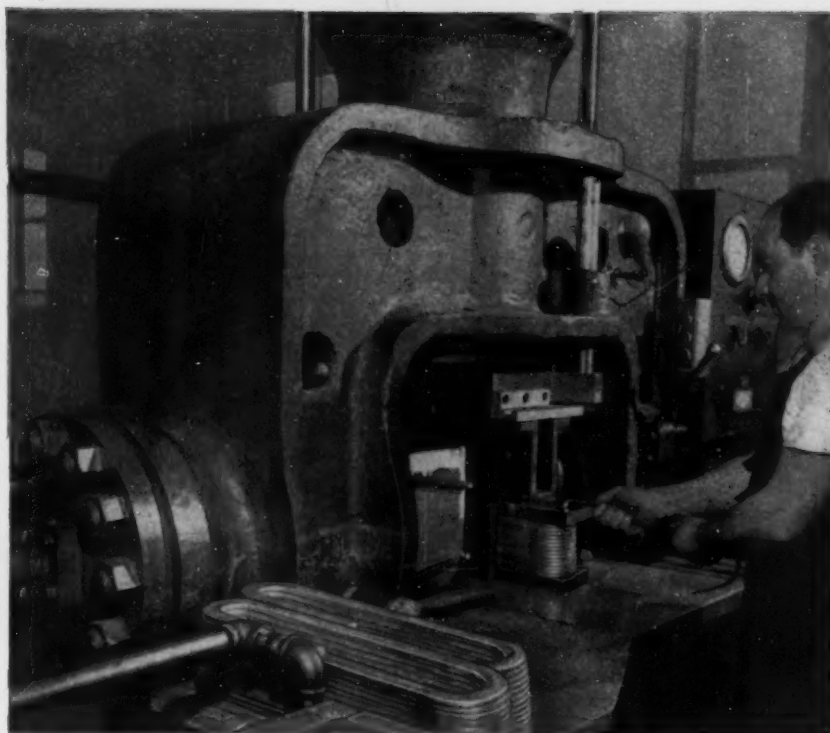
Shows Up Later

Real importance of fingerprint contamination and corrosion has been apparent recently when inspection of stored bearings by the service has revealed this type of corrosion to be present beneath rust preventive compounds. Conventional solvent cleaning procedures used in industry today are often ineffective in removing fingerprint residues.

Aim At Removal

Various specification-approved rust preventives have little or no fingerprint removing ability and at best they can only temporarily suppress corrosion. Hazards presented by the use of boiling methyl alcohol have ruled out this solvent for industrial cleaning. The fingerprint removing type of rust preventives are essentially Stoddard solvent to which have been added petroleum sulfonates, amines, polyhydric alcohols and other additives to produce a product having fingerprint removing and neutralizing properties as well as the ability to displace water from a metal surface.

Turn Page



How this 2-way

FARQUHAR Hydraulic Press

forms motor and generator coils

In producing motor and generator coils from $\frac{1}{4}$ x 1-in. copper stock, the stock is first bent and the ends laminated, and then pressed to restore them to their original thickness. Then, the coil is put in this Farquhar 2-way Hydraulic Press for "pressing" the form.

The coil is laid on a steel block, a three-part filler mandrel inserted, and a top block applied. The press "snugs" the coil sides at low pressure (40 tons); then the vertical ram snugs the top. The operator kicks the pressure-shift pedal, to double vertical-ram pressure for forming.

Capacities of rams are 100 tons horizontally and 200 tons vertically. Illustration above shows operator withdrawing the coil after forming has been completed.

Farquhar Presses Cut Your Costs

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example of Farquhar performance in heavy production! Farquhar Presses are built-for-the-job . . . assure faster production due to rapid advance and return of the ram . . . greater accuracy because of the extra guides on the moving platen . . . easy, smooth operation with finger-tip controls . . . longer life due to positive control of speed and pressure on the die . . . long, dependable service with minimum maintenance cost!

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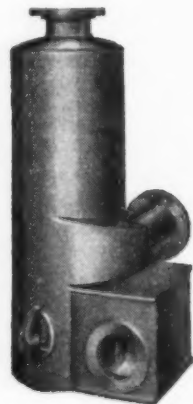


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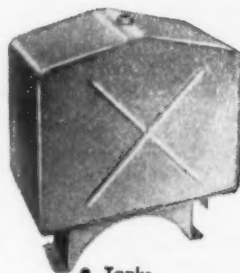
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- Cabinets

—Technical Briefs—

Complete fingerprint removal, not just suppression, is the most important factor to consider in choosing a rust preventive of this type. To achieve satisfactory results the product must remove all three compounds of fingerprint contamination, namely, lactic acid, urea and sodium chloride.

Since all of these components are water soluble and are comparatively insoluble in petroleum solvents many of the fingerprint removing compounds contain a small amount of water, together with the necessary coupling agents.

It is the presence of this water which makes it necessary to thoroughly remove the fingerprint neutralizing rust preventive prior to the application of the final lubricant or preservative.

How to Handle Bearings

Ball and roller bearings should therefore be handled in a manner similar to that used at Marlin Rockwell Corp., at its various plants:

1. After final inspection bearings are given a final wash in petroleum solvent.
2. Bearings are placed in baskets and dipped with agitation for 2 min in a tank of continuously filtered fingerprint remover.
3. Bearings are allowed to drain in baskets and then washed by dipping in a tank of continuously filtered petroleum solvent.
4. Without handling with bare hands bearings are then grease lubricated or dipped in hot rust preventive.

Removes Stencils from Stainless

Colored trademark stencils on stainless sheets can be simply and effectively removed, Armco Research Laboratories reports.

A sudsy solution of a common household detergent and water, plus about one-fourth as much carbon tetrachloride or a similar chlorinated solvent such as trichlorethylene is used. Mix thoroughly and wipe the solution over the stains with a cloth. Rub lightly then rinse with clean water.

NICKEL PIPE:

Hot caustic soda to flow through piping system in Texas.

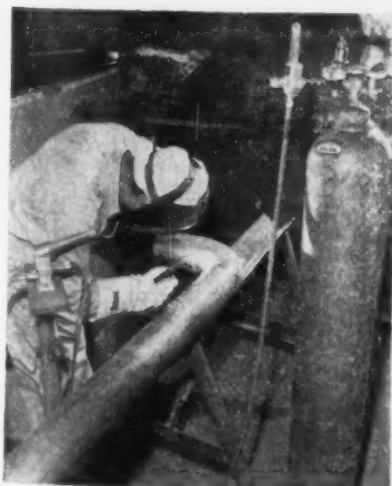
Hot caustic soda solutions used by one chemical manufacturer will flow through a new wrought nickel piping system fabricated by the Gulf Coast Fabricating Co., Houston, Texas. Approximately 10,000 ft long, the piping system will carry caustic soda solutions at temperatures around 600°F., and higher.

Nickel is used for the system since it has excellent corrosion resistance properties. Even at these high temperatures, corrosion rate of nickel by caustic soda is less than 0.020 in. per year.

Pass Inspection

More than 2700 ft of Heliarc welding is done on the piping system. Although pipe and fittings vary in diameter from 1¼ to 4 in., with wall thickness ranging from ⅛ to ¾ in., all the welds are easily made. Welds are sound and pass inspection without any trouble.

Edge preparation for the joints varies. Some joints are hand-ground to a 45° included angle, others to a sharper angle with a 1/32-in. root face. Two passes are used on all joints. The first pass is made without filler rod to obtain a uniform underbead. Then, a second pass is made, using nickel welding rod.



HOT CAUSTIC SODA will flow through this nickel pipe being welded at Houston's Gulf Coast Fabricating Co.

Turn Page

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Facilities include gray iron and alloy foundries, machine shops, with boring mills, automatic and turret lathes, drill presses, screw machines, broaches, milling machines, surface grinders, external grinders, etc. Structural departments for shearing, rolling, punching, forming, gas-cutting, welding and assembly. In all, two modern equipped plants, twenty-five (25) acres.



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FOR MACHINERY MANUFACTURERS — Alten builds machine bases, oil pans, pump and compressor parts, hydraulic components and many other machinery parts.



FOR BUILDERS OF EARTH MOVING EQUIPMENT — Alten makes clutch housings, clutch drums, drum spools, brake drums, wheels, transmission cases, etc.

A complete list of production possibilities is almost inexhaustable. Send your inquiries and prints.

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Foundry & Machine Works, Inc.
LANCASTER, OHIO

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Industrial
America

Since 1889

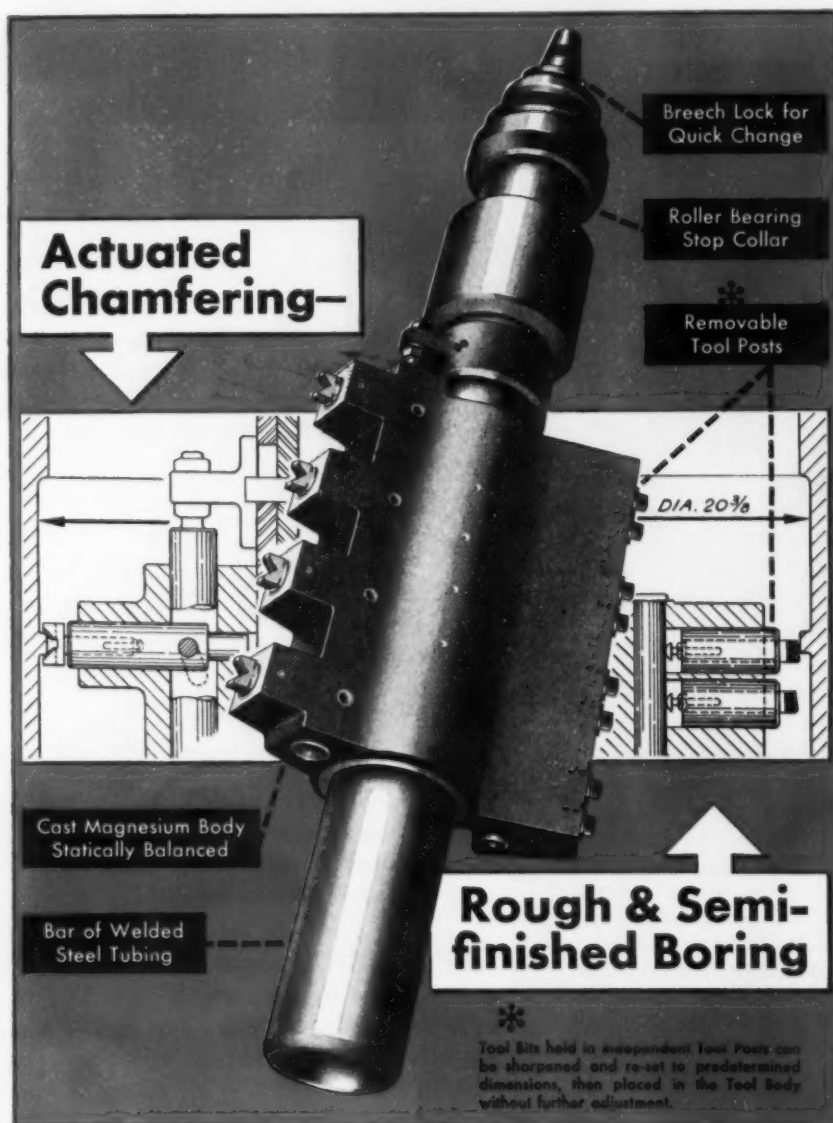
Write
Today for
Booklet
Describing
Facilities

MACHINING:

Better finish, longer tool life attained with carbide inserts

Superior surface finish and extended tool life is being experienced by a manufacturer of vital precision communication and recording equipment in machining SAE C-1118 steel at 1000 sfpm using standard tungsten carbide

triangular insert tools. The operation at McElroy Mfg. Corp., Littleton, Mass., consists of facing two surfaces of a high frequency transmitter component from a maximum of 4 in. in diam down to a 1-in. diameter center shaft as shown in the accompanying sketch. Work is performed on a ¾-hp Logan lathe having a variable drive attachment.



TOOLING by GAIRING

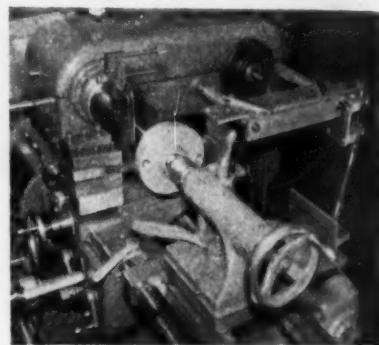
Few of you will recognize the operation pictured here. Part of our defense effort, its exact nature cannot be divulged • All of you, however, will agree that the engineering and manufacturing skill to make tools of such apparent complexity and size — and to make them successfully — should put GAIRING into first place for consideration whenever you require special tooling of any description • May we ask our nearest representative to call?

The GAIRING TOOL COMPANY • 21224 Hoover Road • Detroit 32, Michigan

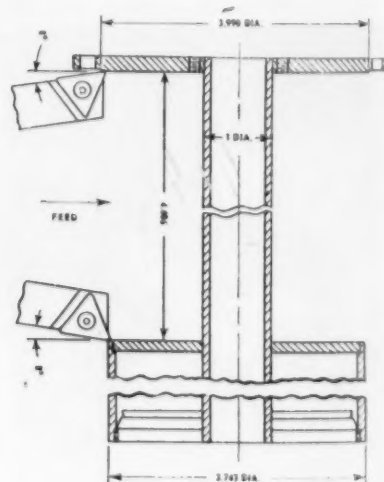
A mirror-like finish is required on the machined surface because it is later plated with a 0.0002-in. thickness of copper over which a 0.0012-in. silver plating is applied. Surface is then buffed down and rhodium flashed to prevent tarnish.

Speed Varied

To obtain the necessary machine finish a surface foot rate of 1000 is maintained throughout the cut. This is done by varying the revolutions per minute from 1000 at the start of the cut to approximately 4000 at the finish by a variable drive unit attached to the Logan lathe and actuated by the tool slide which is fed in at 0.0045 in. per revolution. A



UHF TRANSMITTER component is faced at 1000 sfpm using two Kendex triangular carbide insert tools. Tool grinding was eliminated by replacing inserts after 360 pieces had been faced.



MIRROR-LIKE FINISH on this machining job was obtained by facing at 1000 sfpm. Variable drive unit was used to change from 1000 to 4000 rpm as diameter decreased from 4 to 1 in.

Technical Briefs

chip guard protects the finish-machined surface from scratches.

Finish v. Tool Life

At a lower surface foot rate a satisfactory finish could not be obtained. At the higher speed tool life became a problem. Best tool life received with several grades of triangular inserts first tried on this job was only 20 pieces per cutting edge or 60 pieces per insert.

Now, with Grade K8 Kendex inserts (most abrasive-resistant grade of Kennametal) 60 pieces are faced with each of the three available cutting edges or 180 pieces per insert. Since depth of cut is only 0.007 in., the inserts of left and righthand tools are interchanged to machine an additional 180 pieces.

A total of 360 pieces are faced after which the expendable inserts are replaced with new ones thus eliminating all tool grinding expense on this particular operation.

TESTING:

Refrigeration gas proves aid in leak location.

A nearly fool-proof method of finding leaks in anything from a football to a complicated coil of pipe or a huge distillation tank has been developed with a gas that once served only as the cold-making agent in refrigerators.

The new test medium is Du Pont Freon-12 fluorinated hydrocarbon which, under pressure, is a colorless, virtually non-toxic and odorless liquid, but which changes to a gas when released from pressure at room temperatures.

Thru Smallest Opening

Freon's use as a leak detector stems from its ability to escape through the finest openings in almost any material. The exact location of such leaks can be found quickly with an electronic device or a gas-burning torch whose flame changes color in contact with the nonflammable Freon.

Science has barely scratched the surface of potential uses of Freon

as a leak detector, but already they're as novel as they are time and money-saving for industry.

Flame Turns Green

Halide torches, small hand-held lamps in which methyl alcohol, acetylene, or propane burns with an almost invisible flame, have been used for many years to detect leaks of Freon in refrigeration systems. The sensitive flame turns green or blue-green in the

presence of the gas, and experts can tell by the flame color just how big the leak is.

A more recent development is the electronic leak detector which is responsive to Freon or other gaseous halogenated compounds. The first of these offered for sale was developed by General Electric.

Portable Unit

Weighing only 17 lb and ap-
Turn Page

NEW SBS WATERLESS WASHSTATION*

"brings the washroom
to the worker"*

for only \$52.50 per unit

(F.O.B. Saginaw, Mich. Towel dispensers not included.)

SBS-30 Waterless Skin Cleanser and new type dispenser make possible portable wash-up units that save hundreds of man-hours... thousands of dollars!



SBS Waterless Washstation is a complete hand-washing unit that requires no plumbing because it uses SBS-30, remarkable Waterless Skin Cleanser that removes nearly every soil except lacquer.

- locates close to work areas in factories, warehouses and shops or near outdoor operations.
- saves up to \$720 per unit annually by reducing time workers spend off the job washing up.
- helps keep workers hands clean for better health and greater efficiency in industry.
- reduces crowding in washrooms at lunch time and new shift time.
- eliminates use of harmful and irritating solvents.

SBS Waterless Washstation is constructed of heavy steel and finished in grey-green enamel. Turret top holds SBS-30 dispenser and two of your own paper towel containers. Handy locking storage space in turret top removable cloth bag for used towels in base.

Polished aluminum dispenser has two-way feed adjustment that provides 1000 to 1500 washes before refilling. Easy to refill. One turn of the handle dispenses right amount of cleanser—no leakage, no soap waste. SBS-30 Cleanser is easy to use—workers just rub it on, then wipe it off along with all dirt and grease. It leaves the hands clean, smooth and soothed.

Fill out and mail the coupon below for complete information about SBS Waterless Washstations and our 30-day no-risk money back trial offer.

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SUGAR BEET PRODUCTS CO., SAGINAW, MICHIGAN
Chemical By-Products Division



SUGAR BEET PRODUCTS CO., Dept. 2A, SAGINAW, MICHIGAN
Sirs: Please send me full information about the new SBS Waterless Washstation and your 30-day no-risk money back trial offer.

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TITLE _____
COMPANY _____
STREET ADDRESS _____
CITY _____ ZONE _____ STATE _____

Markal Paintstiks A Complete Line

Markal Paintstiks are available in a complete line for marking hot surfaces up to 2000°F, cold surfaces as low as -50°F.

Wet, dry, icy, rough or slick surfaces can also be marked. Write for full information on the complete line.



Far—Extreme heat 250°F to 1800°F... permanent... comes off in pickling bath

Far—Hot Metal 150°F to 1500°F... will not run, char, flow, discolor or peel. Immersion in cold water will not deface.

Far—Annealing, welding or acetylene torch work. Open hearth stickers, etc.



Far—Metal to be annealed at temperatures up to 1600°F. Marking when cold.

Far—Quick Drying... dries instantly... removed in pickling bath.

Far—All purposes, dry, oily, or icy wet surfaces. Stampings and indentations—steel and plastics.



Far—Metal, wood, etc. 60°F to 160°F. Marks come off in pickling bath.

Far—Lumber either wet, dry or green. Also for crates and boxes.

Far—Lumber, wet, dry, green, creosoted or Wolmanized.

Other types are available for special marking requirements; our engineers will make recommendations if you will outline your special problem.

SPECIAL MARKINGS ON REQUEST

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COMPANY

3050 W. Carroll Ave., Chicago 12, Illinois

THE MARK OF QUALITY

... MARKAL PAINTSTIKS

Technical Briefs

proximately the size of a small portable typewriter, the unit is so sensitive that engineers say it can uncover a leak that would let only 1/100 oz of Freon escape in a year.

Western Electric, manufacturing and purchasing subsidiary of the Bell Telephone System, is supplying a traveling detective version of the electronic tester. This instrument is pulled along on overhead telephone cables and signals leaks which, if not detected and cleared, might impair telephone service.

Filled With Gas

To perform at top efficiency, most telephone toll or long-distance cables are filled with nitrogen or air under pressure and then sealed, thus keeping out moisture and providing an inert atmosphere for the maze of wires within the cable.

To locate leaks which cannot be found economically by other means, Freon-12 fluorinated hydrocarbon is pumped into the cable to displace the nitrogen or air. The electronic tester, sensitive to Freon and riding the cable suspension strand like a monorail car, is pulled along the cable. When the detector spots a leak, a signal is transmitted to the ground crew and repairs are made quickly and surely.

WELDING:

Switch from casting to weldment requires careful analysis.

Careful analysis of part requirements and costs are essential in switching from a cast to a welded design.

Five basic steps suggested by Lincoln Electric Co. in considering a switch to welded parts are: (1) Analyze the cast machine; (2) analyze the cast components; (3) find the least steel needed to do the job; (4) choose trial production parts; (5) test and modify the steel design for production economy.

Service Requirement

Individual machine parts should be classified according to primary service requirement. Is rigidity

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and less hunting? Turn to pages
2 and 3 of

The Iron Age

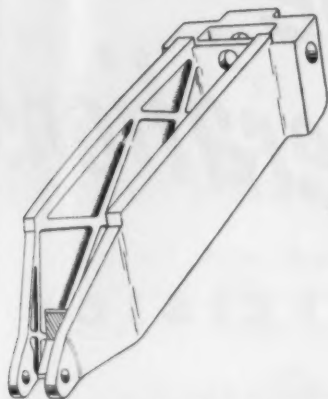
EVERY week and let the

Digest of the Week in
Metalworking

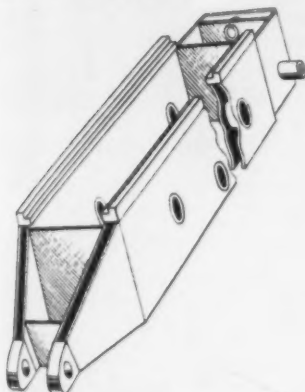
help you find your favorite features.

IT PAYS TO READ
IRON AGE ADS TOO!

Technical Briefs



ORIGINAL cast construction of operating machine lever weighed 182 lb and was produced at a cost of \$38.25.



WELDED STEEL design was tried in place of casting. Part weight was reduced to 86.8 lb, cost brought down to \$20.06.

most important to resist deflection under load? Is strength paramount to withstand loading forces without fracturing? Is it the type of part where no loads exist? Principle type of loading should then be determined. Is it tension, compression, bending or torsion?

A detailed analysis for each machine component should be developed. This can be done by sketching the component and its loading, if known. Then choose the section through the casting that represents the likely design section for loading.

Cross-sectional Areas

Finally, determine the necessary properties for the cast iron section. Find cross-sectional area for all loadings. For bending, column and torsion loadings, material must be concentrated as far from the center as in the cast design.

Once the cross-sectional area satisfactory for iron is known, principles of equivalent sections can be applied for steel.

It's a Hamilton



INDEED

There is no way under the sun to do small, precision tapping with "production" speed, satisfactory tap life and acceptable accuracy, other than to use a tool designed for the specific purpose.

THE *Hamilton* SUPER-SENSITIVE SMALL HOLE TAPPING MACHINE IS SUCH A TOOL!

The complete story of this machine is told in our Bulletin T-471.

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Specialty

Meets All Specifications.
Best Fabricating Qualities.

HELICAL TUBING



Welded and Cold Drawn
Stainless Steel Tubing

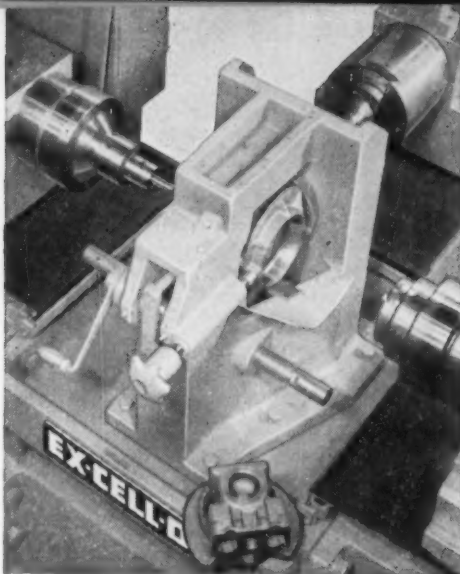
Special Purpose Tubing In All Available Materials

As Welded

For full detailed information about Helical Tubing, send today for your HETCO Catalog.

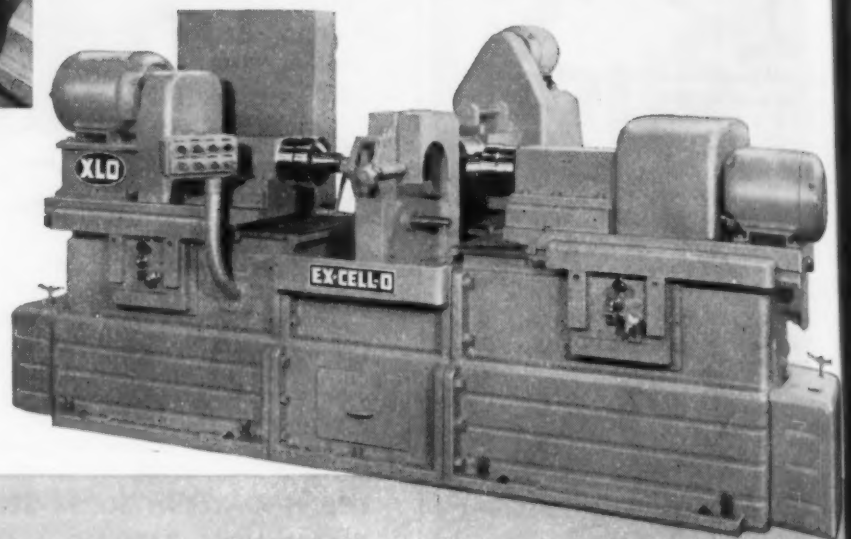
HELICAL TUBE CORPORATION

19 Washington St., East Orange, N. J.
Manufacturing Plant—Grand Rapids, Michigan



Close-up view shows relatively simple tooling.

Ex-Cell-O Three-Way Precision Boring Machine.



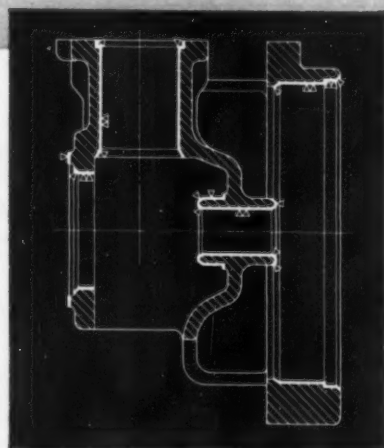
COMBINING OPERATIONS CUTS COSTS, BOOSTS OUTPUT, PROMOTES ACCURACY

Once a part is properly located and clamped it's good practice to do as much machining on it as possible before it's moved. In this way the various operations can be held in accurate relationship to one another, production is increased, and handling time is minimized.

In machining this cast-iron refrigeration crank-

case, five roughing and eighteen finishing operations are held in accurate relationship to one another, with extremely close tolerances on the crankshaft and cylinder bores. Net production for the roughing operation is 33 parts per hour; for finishing, 36 parts per hour.

Ask your local Ex-Cell-O representative about all the other advantages of Ex-Cell-O Way Machines, or write today for Bulletin 31631.



Sectional view with heavy lines to show operations. Single and double triangles indicate, respectively, single operation and rough-and-finish operations.



EX-CELL-O CORPORATION

DETROIT 32, MICHIGAN

MANUFACTURERS OF PRECISION MACHINE TOOLS • CUTTING TOOLS • RAILROAD PINS AND BUSHINGS
DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

Consumers Keeping Strong Pressure on All Sources

Auto people giving steel market strongest push . . . Conversion, premium prices linger . . . Iron Age Scrap Composite rises again . . . Ingot rate holds at high level.

Overwhelming demand for steel continues to be reflected by anxious consumers pressing to get their orders on mill books. Those unable to place satisfactory tonnage on the books are putting extra zip into the market by other maneuvers to get the steel they want.

Here are some of the signs that the "hot" steel market is still a long way from cooling off:

Pushing Hard . . . (1) Conversion deals, which had been expected to peter out at the end of 1952, are still going great guns. Consumers are searching (some almost frantically) for ways to get out from under the extra cost burden. But when it comes to a showdown they will pay for conversion rather than trim production schedules. If one consumer trims his conversion commitments, there are others waiting in line to grab the tonnage.

Still Sell Premiums . . . (2) Consumers still find it necessary to pay premium prices of marginal or high-cost producers. They will turn their backs on these suppliers as soon as they can fill their needs at regular mill prices.

Only one premium-priced producer has so far found it necessary to trim prices because it needed orders. Even after slashing its price \$23 a ton on structurals, this producer is still charging considerably more than most other mills.

Others charging premium prices are still able to operate at a merry clip without shaving prices. This sure sign of market strength will bear watching, and disappearance of premium prices will be interpreted

as an early sign of falling demand.

Foreign Demand Lingers . . . (3) Another sign of current market strength is continuing demand for foreign steel. Although imports are far from the post-Korean high, and some importers have been caught with hard-to-sell shipments, consumers continue to nibble at foreign tonnage outside of their regular supply channels.

Autos Press Hard . . . The auto industry, steel's biggest customer, is applying by far the most pressure to keep the market tight. Despite their strong buying position, automotive purchasing agents are augmenting regular mill tonnage from all the above sources.

Auto production schedules for first quarter and first half are running ahead of record-breaking 1950. Impact is accentuated because these terrific schedules were imposed on top of an inventory vacuum following last summer's steel strike.

Gamble Pays Off . . . Hindsight shows automakers took a gamble that paid off. In spite of National Production Authority quotas limiting first quarter production to 1,250,000 cars, they scheduled output at more than 1.5 million. Gamble was that production limits would end before quotas were reached.

This high production has had its price. Some auto plants have been forced to obtain as much as half their steel from expensive conversion or foreign sources, at nearly twice the cost of mill steel.

Industry Getting Sore . . . Aluminum producers have added their voices to the chorus of demands for clear-cut expression of government intentions on decontrol. Like steel people, they want assurance that advanced Controlled Materials Plan allotments for all but military orders will not extend past the end of control authority June 30. It follows that they want to book unrated orders after June 30 on an unrestricted basis.

Neither steel nor aluminum producers have as yet received a satisfactory answer from Washington. This has resulted in considerable confusion on the part of both producers and consumers. Will producers have to continue honoring tickets after controls authority is dead and CMP has been scrapped? And should consumers continue to look to Washington for their allotments, or can they afford to rely on restoration of free market relationships with producers?

Shocked by Attitude . . . Industry people are critical of the lack of communication between their representatives and top mobilization officials in Washington. They are appalled at the dearth of information and understanding of industry's problems on the part of controls officials.

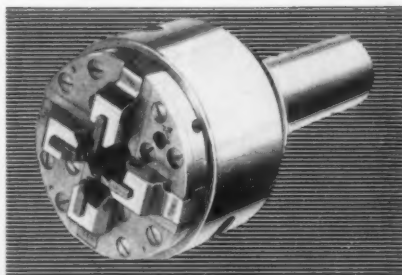
In addition to their keen desire to be free of controls, they are motivated by a feeling that they have not been getting a fair shake. They are outspoken in their criticism of any plan to continue controls.

Scrap Rises Again . . . Steelmaking operations this week are scheduled at 100.5 pct of rated capacity, unchanged from the previous week.

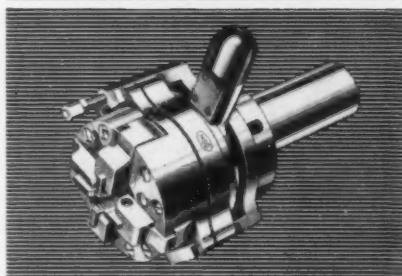
The Iron Age Steel Scrap Composite Price is \$44.25 per gross ton, up 25¢ from last week.

An IDLE man at a BUSY automatic spells PROFIT.
A BUSY man at an IDLE machine spells LOSS. *SS*
H&G Insert Chaser Die Heads are preferred by screw machine engineers because they spell less down time, lower costs, cleaner, more accurate threads. *SS*

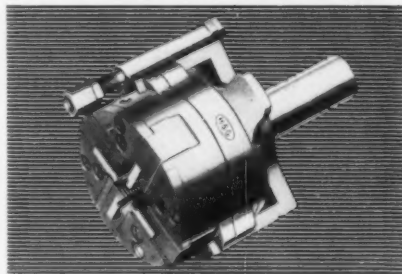
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Not you, but your products! Do you weigh in receiving, at production stages, etc. to protect your operation against overcharges, losses, miscalculations? **HYDROSCALE**, the hydraulic crane scale, makes it practical to check whenever and wherever you should, weighs on the spot, eliminates weighing stations and man power and equipment tie-ups.

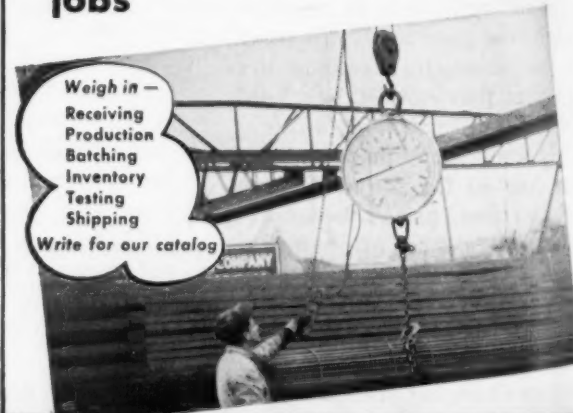
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Market Briefs and Bulletins

Steel Stocks Worst in South . . . Steel warehouse inventories in the South are about half what they are in other parts of the country, reports American Steel Warehouse Assn. Northern warehouses are back up to two-thirds normal inventories, but in the South inventory level is only one-third of normal.

Strikes Slugged Steel Shipments . . . Finished steel product shipments in 1952 totaled 68,003,612 tons, a decrease of nearly 11 million tons from the 1951 record year, reports American Iron & Steel Institute. Despite the reduced total supply, manufacturers of direct military items received 2.1 million tons of steel in 1952, an increase of 900,060 tons from 1951. Shipments to automakers, the construction industry, rail transportation and consumer goods classifications were cut the most.

Coal Mining Slows . . . Mild winter weather has left many coal companies heavily stocked. In the Mount Carmel, Pa., area (THE IRON AGE, Dec. 25, 1952, p. 17) major companies are reported to be operating only 3 days per week. Unless the situation changes, there is a real possibility that mines will not be operated at all this summer.

South Orders More Freight Cars . . . Southeastern railroads are again purchasing large numbers of freight cars. Two weeks ago Louisville & Nashville R.R. Co. ordered 1000 freight cars costing about \$6 million. Last week Central of Georgia R.R. and its affiliate, Savannah & Atlantic R.R., placed orders for 1200 freight cars costing \$7.2 million. All these orders were placed with the Bessemer, Ala., plant of Pullman-Standard.

Bethlehem Adds New Line . . . Bethlehem Steel's Los Angeles plant entered the wire coil business last week. Heavy demand by California farmers for wire caused Bethlehem to install new spooling equipment.

Won't Curb Tin Exports . . . There will be no curbs on U. S. tin exports in the first half of 1953 so long as shipments meet national security requirements, Office of International Trade says. Tin supplies, according to the agency, have improved sufficiently to allow removal of exports quotas, but OIT will still require licensing as a check on the intended destination of tin shipments.

Almost Merge . . . Only the objections of Willys-Overland's major stockholder stopped a merger of Willys and Kaiser-Frazer Corp. Boards of Directors of both firms met in New York last week, but negotiations bogged down because Ward Canaday, Willys' chairman, reportedly balked over the value placed on Willys' stock.

Farm Equipment Slump? . . . Unless farm prices are pushed up, the market for farm equipment may get even softer. At present there is a pileup at distributor levels as dollar volume of production is exceeding distributor dollar volume rate. If there is to be any change in this situation it will come in March and April.

Decontrol Aluminum Scrap . . . Allocation controls over aluminum scrap were dropped this week by National Production Authority, revoking NPA order M-22. Second quarter supplies of aluminum are estimated at 415,000 tons—enough to meet both military and civilian requirements. Removal of price controls over aluminum scrap makes it unnecessary to continue M-22.

STEEL OPERATIONS

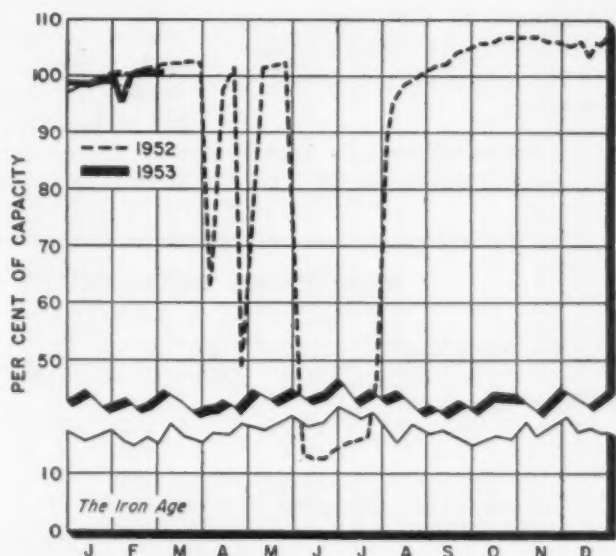


District Operating Rates

District	Week of Mar. 1	Week of Feb. 22
Pittsburgh	106.0	106.0
Chicago	102.0	103.0*
Philadelphia	96.0	96.0*
Valley	101.0	101.0
West	106.5	107.0
Cleveland	96.5	95.0*
Buffalo	94.0	94.0
Detroit	105.0	105.0*
Birmingham (South)	98.0	98.5
Wheeling	102.0	102.0
South Ohio River	92.5	92.5
St. Louis	96.0	93.5
East	91.0	104.0*
Aggregate	100.5	100.5

Beginning Jan. 1, 1953, operations are based on annual capacity of 117,522,470 net tons.

* Revised



Nonferrous Markets

Copper Muddle Slow to Clear Up

Price for newly mined copper ranges from 27½¢ to 32¢ per lb as Anaconda moves to 32¢ . . . Brass mills post new scrap buying prices, new mill product prices—By R. L. Hatschek.

Following the decontrol of primary copper and aluminum last week, prices of the red metal were thrown into utter confusion while aluminum remained steady (see p. 111 for further details.)

It seemed that the markets would clear themselves almost immediately but it didn't happen. Early this week the market spread for newly mined copper moved to 27½¢ to 32¢ per lb for electrolytic copper delivered Connecticut Valley with most custom smelters at 32¢. There was no business in Lake copper but the price is quoted higher this week in accordance with other copper prices.

Anaconda Moves . . . While Kennecott and Phelps Dodge maintained their quotations at 27½¢ and 28½¢, respectively, from last week there was no word last week as to what level Anaconda Copper Mining Co. would peg its price. Belief was that 32¢ would be the figure and this was confirmed when Anaconda moved to 32¢ on Monday.

Anaconda Wire & Cable quoted new copper wire prices last week on the basis of a 33.80¢ average for domestic and foreign copper. This put a several-cent spread in wire prices.

Hike Brass Prices . . . Scovill Mfg. Co., Revere Copper & Brass,

MONTHLY AVERAGE PRICES

The average prices of the major non-ferrous metals in February based on quotations appearing in THE IRON AGE were as follows:

	Cents Per Pound
Electrolytic copper, Conn. Valley . . .	25.413
Lake Copper, delivered	24.625
Straits tin, New York	\$1.215
Zinc, East St. Louis	11.478
Zinc, New York	12.308
Lead, St. Louis	13.30
Lead, New York	13.50

and Chase Brass & Copper all came out with new lists for brass mill products. Basis for the higher prices was copper at 31.10¢ and zinc at 12.58¢. Higher costs for labor, freight and other factors were also reflected. Mill product prices are quoted on p. 216.

Brass mill scrap buying prices were also posted late last week, considerably higher than Office of Price Stabilization ceiling levels. Copper was pegged at 27½¢ to 29⅞¢ and yellow brass at 20⅝¢ to 22⅜¢ for solids, with slightly lower prices for turnings.

Reshuffle Scrap . . . Some custom smelters were reported to have cut their scrap buying prices by ½¢ as they met some resistance to the 32¢ electrolytic copper price and they had accumulated pretty good quantities of scrap at 29¼¢.

Dealers, however, were willing to pay higher prices than at the beginning of last week. The range for No. 1 heavy copper and wire scrap is quoted at 25¢ to 26¢.

London Talks On . . . Freeing of copper from controls in Britain and the reopening of the London Metal Exchange for dealing in the red metal are expected to be brought closer to reality in the next few days. The move will be discussed between the British non-ferrous industry and Commonwealth copper producers in scheduled talks.

Main subject will be prices. One outcome may be a joint approach to the government on prices, which are thought to be too high, and of restoring buying to the industry again. It is expected that full freedom will be restored this year and that the copper market in London will be simultaneously reopened.

Price Closes Mine . . . Last week the price of zinc slipped another ¼¢ downward to 11¼¢ per lb f.o.b. East St. Louis for Prime Western grade. With the market continuing at about that level, American Smelting & Refining Co. has had to close down its Ground Hog mine in New Mexico.

This mine produces annually about 15,000 tons of zinc and 2500 tons of lead. And it isn't the first mine to close down because of market conditions this year.

Sliding Tax . . . Meanwhile, Felix Wormser, vice-president of St. Joseph Lead Co., continued his campaign to get a variable import duty tacked onto lead and zinc. Latest plug for the plan was before a San Francisco mining group.

The plan would work like this: Tariff would increase 1¢ per lb for each 1¢ per lb the metal sank below a "base" price to be established. Maximum would be 5¢. The plan to maintain prices high enough to perpetuate the domestic mining industry is before several mining state legislatures.

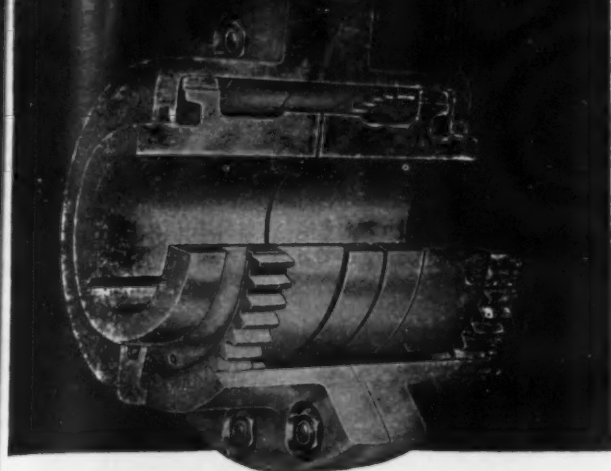
NONFERROUS METAL PRICES

	Feb. 25	Feb. 26	Feb. 27	Feb. 28	Mar. 2	Mar. 3
Copper, electro, Conn.	27.50-	27.50-	27.50-	27.50-	27.50-	27.50-
	32.00	32.00	32.00	32.00	32.00	32.00
Copper, Lake, delivered						
Tin, Straits, New York	\$1.21½	\$1.21½	\$1.21½		\$1.21½	\$1.21½*
Zinc, East St. Louis	11.25	11.25	11.25	11.25	11.25	11.25
Lead, St. Louis	13.30	13.30	13.30	13.30	13.30	13.30

Note: Quotations are going prices.

*Tentative.

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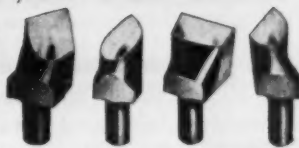
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Iron and Steel Scrap Markets

Where and What is No. 1 Heavy Steel?

Some scrap centers claim little or no business in No. 1 heavy melting as such . . . Has risen into low phos grade . . . In one area "No. 1" leaps . . . "Slips" in another.

With OPS performing the ceremony, No. 1 heavy melting steel was wedded to No. 2 steel and bundles. But the "marriage of the grades" did not endure—for in many cases the groom (No. 1) fled quickly and with some modification changed his name to OPS Grade 17 alias low phos.

Today several scrap centers are hard put to locate their traditional bellwether grade—and in some little or no business is being transacted in No. 1 heavy, as such.

New York scrap brokers were in a dither when an eastern mill reportedly bought No. 1 heavy at a delivered price of \$48.50. This was not No. 1, they claimed, merely a mongrel grade of low phos. (See New York, Phila.)

In Pittsburgh two consumers reported buying No. 1 and No. 2 combined at \$44 delivered. And the trade there agreed very little No. 1 could move at that price—unless shippers suddenly went berserk with charitable compulsions. Perhaps the price of No. 2 will later stabilize somewhere between this high and low.

Pittsburgh—It is almost impossible to understand what is happening in the Pittsburgh market. Two consumers reported buying tonnages of No. 1 bundles at \$45, No. 1 heavy melting and No. 2 heavy melting combined at \$44, and No. 2 bundles at \$42 delivered. Yet it is agreed that very little No. 1 heavy melting is moving at \$45. Most of this material is moving as low phos at \$51 delivered. The turnings market is weaker.

Chicago—With consumers attempting to wait-and-see, broker buying was picking up in railroad grades. Openhearth continued to move well and heavy melting continued in small supply. Electric furnace movement

was not strong and cast continued very slow. A purchase at below ceiling of No. 2 dealer bundles did not seem to be affecting speculation in No. 1 bundles, and clipping prices continued high. Though railroad grade sales were being made at ceiling in some cases, a boost hit the market Thursday and nearly all roads offering scrap were taking over ceiling price on some grades.

Philadelphia — A sale at \$48.50 delivered of scrap labelled No. 1 heavy melting threw the trade into a tizzy during the week. But because of the relatively small tonnage and certain other considerations the market was not pegged at that level. It did, however, move up to \$44 to \$45. No. 2 bundles weakened \$2 a ton, and some cast grades were off \$1.

New York—An eastern mill's purchase of quality scrap as No. 1 heavy at \$48.50 delivered started a debate on what constitutes No. 1 and what's low phos. Some claimed this purchase did not establish a true market because of mill selection at yards and high standards. Yet brokers conceded the price of No. 1 should be \$38.50 to \$39.00 when and if it is reestablished fully. No. 2 bundles and turnings were slightly weaker pricewise.

Detroit—Big automotive lists established No. 1 bundles at the former ceiling price. Electric furnaces are paying higher prices for bundles here, but openhearthers are standing pat at old ceiling price levels. No. 2 grades are holding quite firm in spite of a general feeling they would fall off in a free market.

Cleveland—Low phos moved up \$1 to \$50 here this week as the market in electric furnace remained fluid. In Youngstown No. 2 bundles tumbled \$2 to \$42 as dealers and brokers tried to keep all prices stable. Turnings market generally remains weak. But some tie-in deals have been reported

in which prime factory scrap and turnings both went at ceiling.

Birmingham—Southern scrap dealers have been working overtime getting shipments to mills started before the first of March. Practically all mills had agreed to accept all shipments under contract at the price specified provided they were in transit by Feb. 28. No area mills were buying this week, but one northern mill purchased 2000 tons at ceiling prices.

St. Louis — Mills are proceeding cautiously, buying no more than 500 tons at a time and telling brokers they will issue another order when one is filled. They are "comfortably" situated as to inventories which are still increasing. Movement is expected to be slowed by bad weather.

Cincinnati — A few mills in the area have brought March tonnages and the expected happened — most items went at ceiling. Rails of random length went up \$2 to \$50 this week but wild rumors about a \$60 market apparently aren't justified. Cast market is extremely dull. Lag is reflected in No. 1 cupola which dropped \$1 to \$48. One firm in the area sold 14,000 tons of prime factory bundles at ceiling.

Buffalo—Price advances ranging up to \$1.50 a ton on shipments in the immediate area were posted on steel-making grades of scrap as the area's top consumer placed orders on a delivery basis. But prices on shipments from outside the area were averaging lower in some instances because of freight charges. New business did not include No. 1 steel or machine shop turnings.

Boston — The scrap trade in New England is trying to hold onto OPS ceiling levels as long as possible. But it's beginning to look like a losing battle. No. 2 steel is still moving at \$33.17 but there is also business at \$2 below that.

West Coast — Steelmaking scrap continued sluggish last week with no price changes. Cast showed signs of revival but at lower prices. In San Francisco, No. 1 cupola cast dropped to \$38, in Los Angeles to \$39 and in Seattle to \$37, with mixed yard cast there down to \$36.

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NEWS OF USED AND REBUILT MACHINERY

May Keep M-101 . . . Best guess is that National Production Authority's Industry Advisory Committee on Used Machine Tools will recommend continuance of M-101 inventory report provisions even after NPA is disbanded.

The advisory group met Mar. 4 and reviewed the effectiveness of order M-101 as an aid in helping the NPA locate certain types of critical machine tools for dealers and defense contractors. The order, which went into effect Mar. 7, 1952, requires dealers and rebuilders of used machine tools to send NPA an inventory report every time certain types of machine tools are acquired.

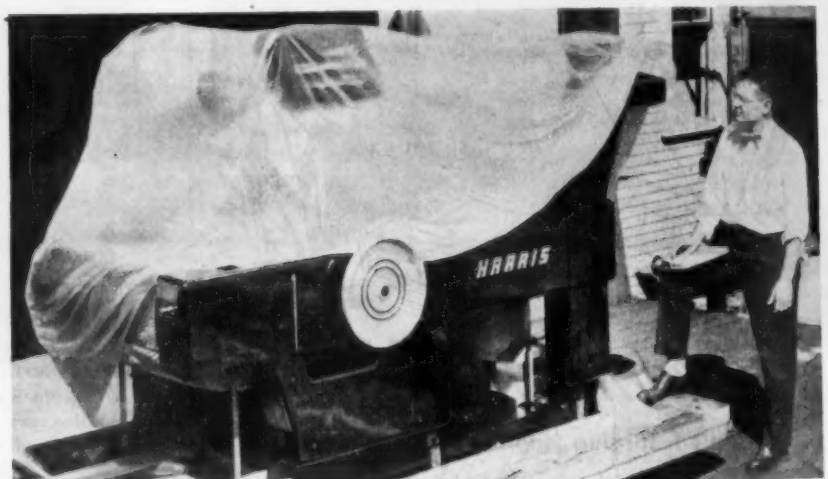
Though a report on the advisory committee's recommendations was not available at press time, it is believed that there is strong sentiment favoring continuance of M-101 provisions until the present defense emergency is over.

Want National Statistics . . . The sales statistics program being

pushed by the Machinery Dealers National Assn. may be tried on a nationwide scale before the next MDNA convention which is scheduled for Cleveland, June 9-11. Currently being pilot-tested by MDNA's New York-New England Chapter, a program designed to obtain sales statistics from the whole membership will be discussed by the MDNA Board at its next meeting in Buffalo, Apr. 22.

If the association decides to go through with this plan, forms requesting sales statistics will be mailed to all MDNA members, and a report based on these figures will be given at the convention.

Expect Some Resistance . . . It is hoped that information on dealers' dollar sales will be obtained in addition to statistics based on percentages of sales increases or decreases. But some dealer resistance to divulging dollar sales is expected, despite the fact that the reports of individual firms will be kept confidential.



NO GREASE NEEDED to protect machinery during shipment when it's packed in a plastic bag. Harris-Seybold Co., Cleveland printing press manufacturer, has eliminated the time wasted degreasing machinery before installation in a customer's plant by shipping its small presses in new Vanant plastic covers. Before the bag is put around the machinery, all bare metal surfaces are covered with Angier V.P.I. vapor-inhibiting paper. While there are no reductions on the cost of crating and shipping with this method, Harris-Seybold reports savings do result because less time is needed for installation. Effectiveness of the new packaging method was given a severe test recently when one of the plastic-bagged presses was left on a receiving dock for 2 days in a heavy rain. After inspecting the press on installation, the company reports it was completely free from rust.